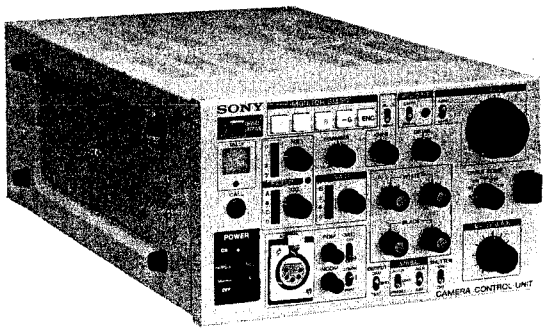
SONY

CAMERA CONTROL UNIT

CCU-350



OPERATION AND MAINTENANCE MANUAL
2nd Edition (Revised 3)
Serial No. 24001 and Higher

For customers in the U.S.A.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

For the customers in Canada

This apparatus complies with the Class A limits for radio noise emissions set out in Radio Interference Regulations.

Pour les utilisateurs au Canada

Cet appareil est conforme aux normes Classe A pour bruits radioélectriques, spécifiés dans le Règlement sur le brouillage radioélectrique.

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SECTION 1 OPERATION

1-1. OVERVIEW

The CCU-350 is a camera control unit designed for Sony portable color video cameras, and comes equipped with multiple remote control and adjustment functions which make it possible for it to be used for field and in-house applications.

Compact and light weight
The unit is compact and light for maximum handling ease. All operations and adjustment functions are housed in a single cabinet.

300 m maximum cable length
Thanks to the unit's signal adjustment ability, it is possible to extend the camera cable (CCW-B cable) up to a maximum length of 300 meters. The conventional CCW cable can be used, too.

Gen-lock function
It is possible to use not only internally generated sync signals but external sync signals as well for gen-lock, and to adjust the horizontal phase and the subcarriar phase of the external signals for gen-lock.

Multiple output signals
A wide range of output signals can be produced: VBS, VB, cable-compensated chroma key (R,G,B), encoder, sync and blanking signals. It is also possible to output Y/R-Y/B-Y signals.

Prevention functions
An AC power cord, equippped with a plug strap, is provided in order to prevent trouble from power loss caused by a plug being accidentally disconnected. The switches and controls are disabled by pressing the PANEL ACTIVE button to avoid mis-operation.

Easy maintenance inspection
The front panel is designed to open and close by finger-tip control, thereby making it easy to perform internal inspections and adjustments even if the unit is mounted in a rack.

1-2. PRECAUTION

On installation

Location

- Inastall the unit in a location which is dry and well ventilated as possible.
- Avoid installing the unit near heat sources and in rooms with a high temperature.
- Avoid locations susceptible to dust and a great deal of vibration.
- Avoid places with strong electrical and magnetic fields.
- Avoid places where the unit will be exposed to direct sunlight and powerful electric lights.

Rack mounting

By using the optional RMM-301 rack-mounting brackets, it is possible to mount two units side by side in an EIA standard rack. Mount the units so that they are not positioned above a power source or any other heat-generating unit.

On operation

Cable insertion and extraction

Do not insert nor extract the CCW cable connector while the CCU-350 power is on.

Inoperable controls on the camera

Some switches and controls on the camera do not operate when the CCU-350 is connected to the camera, and some switches and controls on the camera cannot be controlled by the CCU-350. For details, refer to the operation manual of the camera or camera adaptor.

Connection to a camera adaptor

To connect the CCU-350 to a camera adaptor which outputs primary color signals (R, G and B) (i.e. CA-3512), set the S-1 switch on the VA-63 board to the upper position. To connect the CCU-350 to a camera adaptor which outputs luminance and color difference signals (U, V and Y) (i.e. CA-50), set the S-1 switch to the lower position.

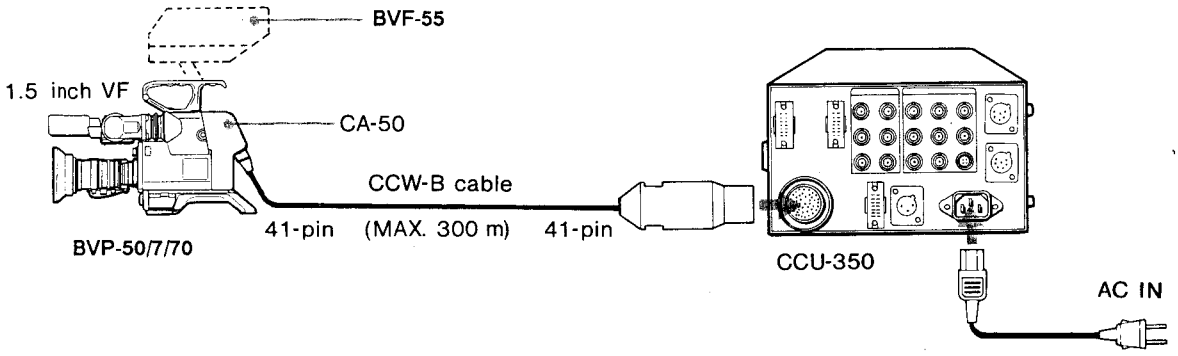
Connection to RCP remote control panel/MSU master setup unit

When a remote control panel or an MSU-350/370 master setup unit is connected to the CCU-350, first check that the panel's display operates normally after turning the POWER switch on.
Second, check the PANEL ACTIVE button.

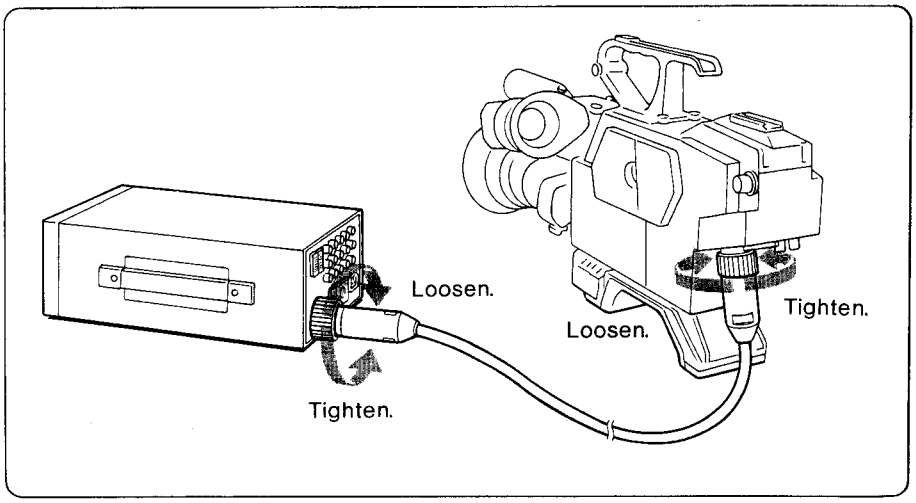
1-3. CAMERA CONNECTIONS

Connection to the BVP-50/7/70

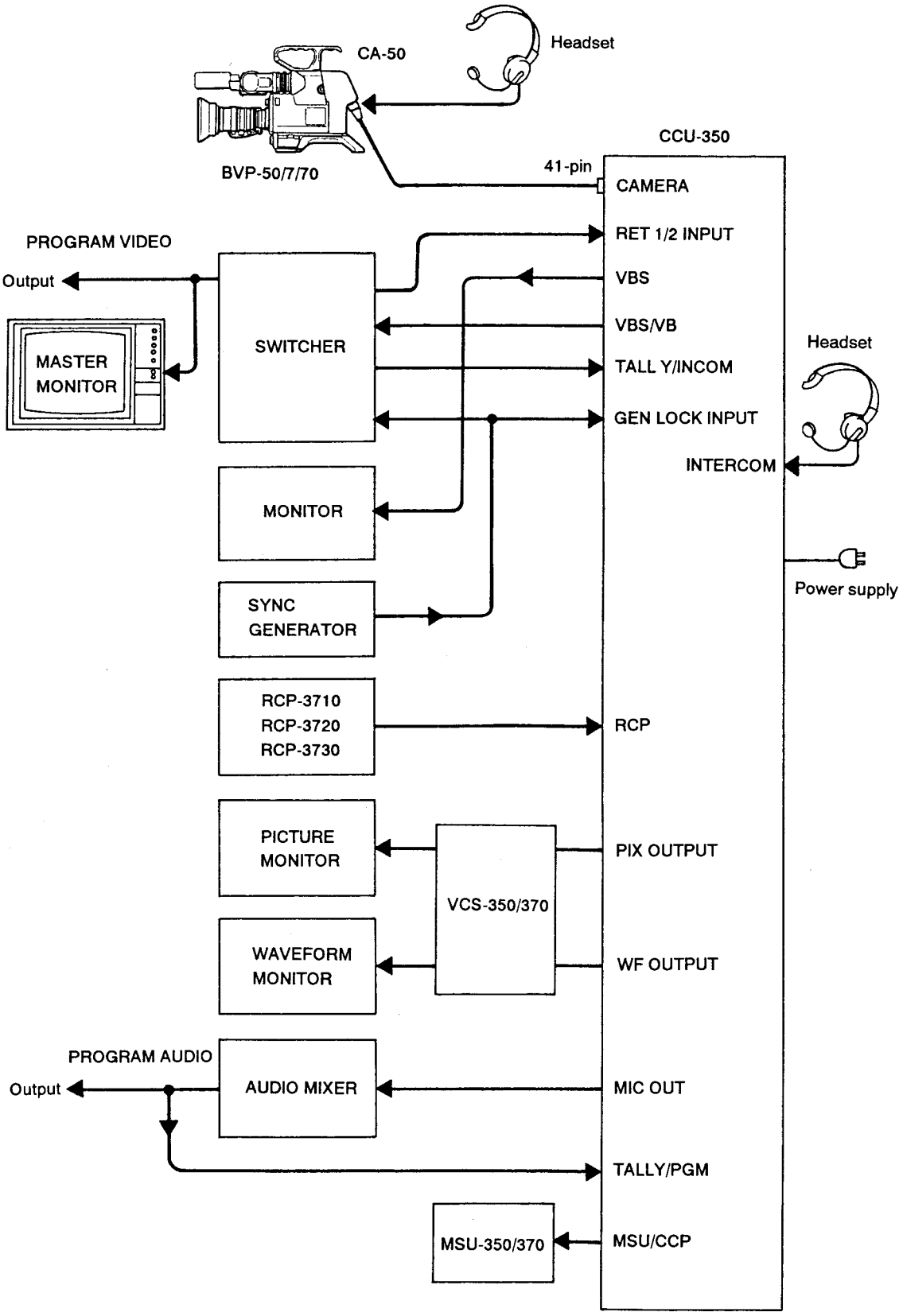
Install the CA-50 to the BVP-50/7/70



Align and insert the connector of the CCW-B or CCW cable. To secure the connection, rotate the coupling ring clockwise on the camera, and counterclockwise on the CCU-350.

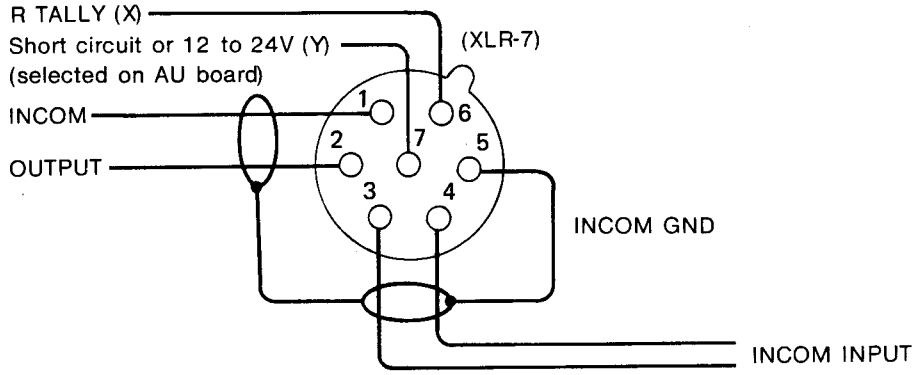


1-4. SYSTEM CONNECTIONS

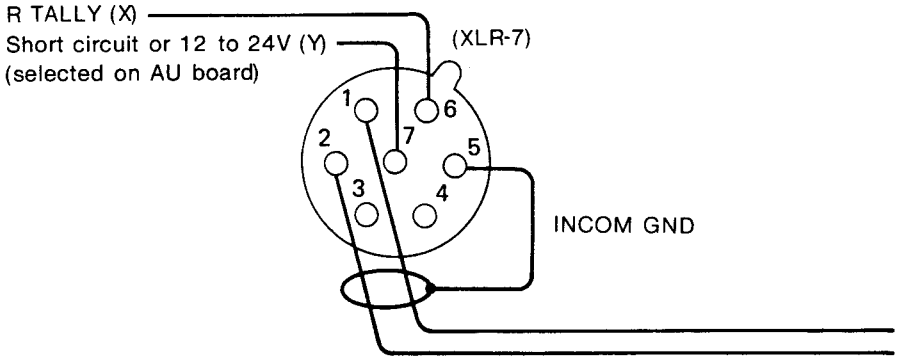


R TALLY/INCOM connector wiring diagram

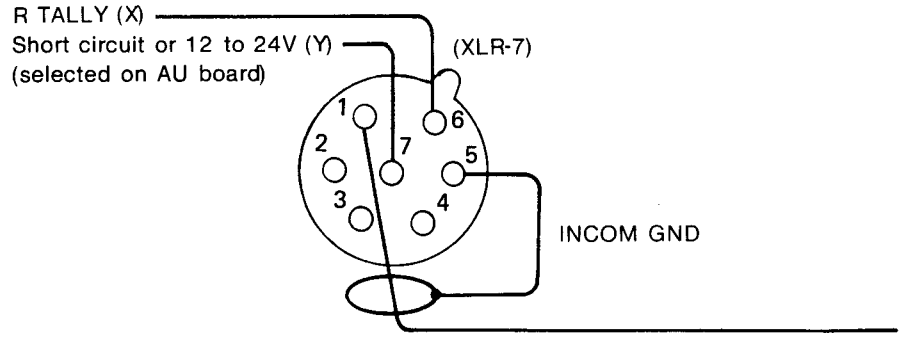
- **4-wire system**



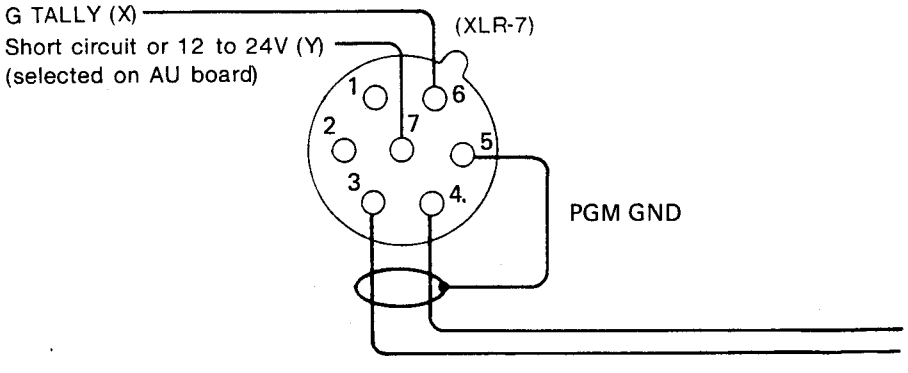
- 2-wire system



- RTS



G TALLY/PGM connector wiring diagram



Connection to the MSU-350/370

Some connections require switch setting on the circuit boards in the MSU and CCU-350. For details, please refer to the instruction manual furnished with each unit.

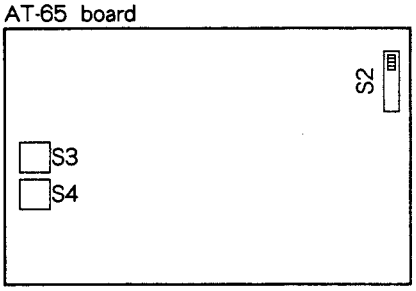
MSU-350/370

When a CCU-350 is connected to either of the CCU connectors on the rear panel of the MSU, be sure to terminate the connector with switch in the MSU. (For details, refer to the imstruction manual of MSU)

CCU-350

To connect the CCU-350 to the MSU, set switches S2, S3, S4, and S6 on the AT-65 board of the CCU-350 as shown below.

AT-65 board



S2 (SYSTEM MODE)

When the CCU is connected to a MSU-350/370 system or RCP-3730, set the switch to the 370 position.
(When the CCU is connected to a MSU-360 system, set the switch to the 360 position)

S3 (GROUP SELECT)

When the VCS-350 connected to the PIX/WF OUTPUT signals from the CCU, is set to the sub mode (expansion mode), set the switch according to the PIX/WFM connector numbers of the VCS (main mode) and input the VCS's (sub mode) WFM/PIX OUTPUT signals.

PIX/WFM connector	Switch setting
8 (For MSU-350/370)	1
7	2
6 (For MSU-370)	3
5	4

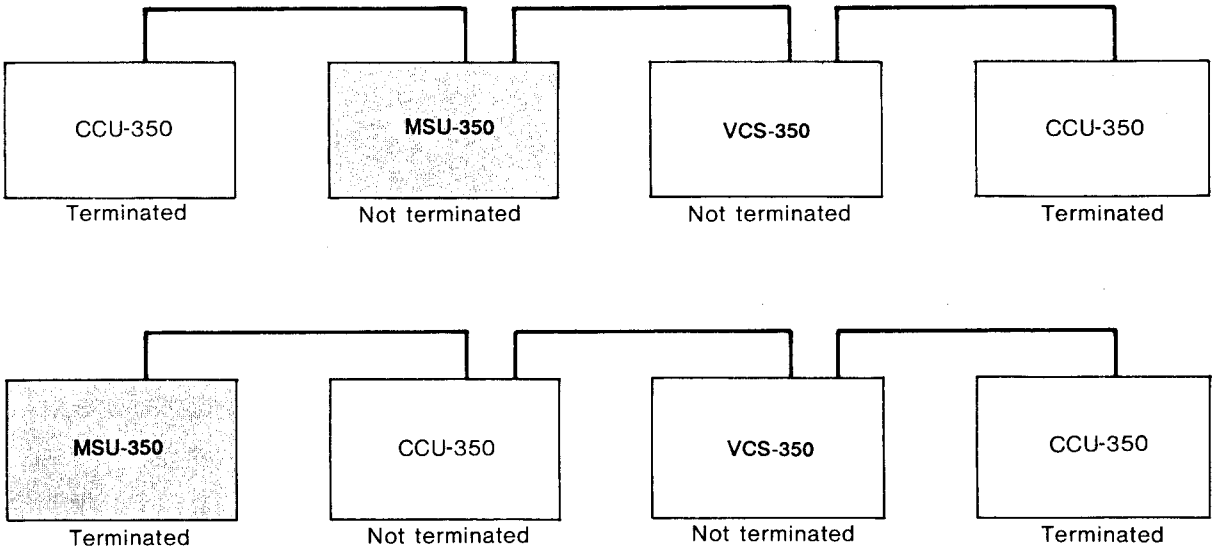
- Normally, set the switch to 0.

S4 (CAMERA SELECT)

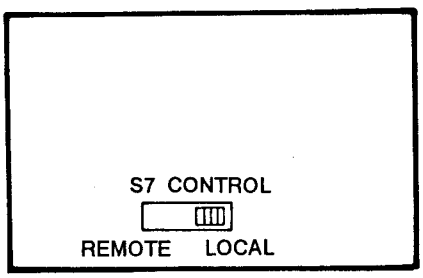
Set the switch according to the connector of the MONITOR IN 1 through 8 connectors on the VCS-350/370 to which the CCU-350 is connected.

S6 (TERMINATION)
When the CCU-350 is connected in a chain configuration, set the switch to OFF (not terminated). When the CCU-350 is used alone or when it is the last machine of the chain connection, set it to ON (terminated).

Example of termination



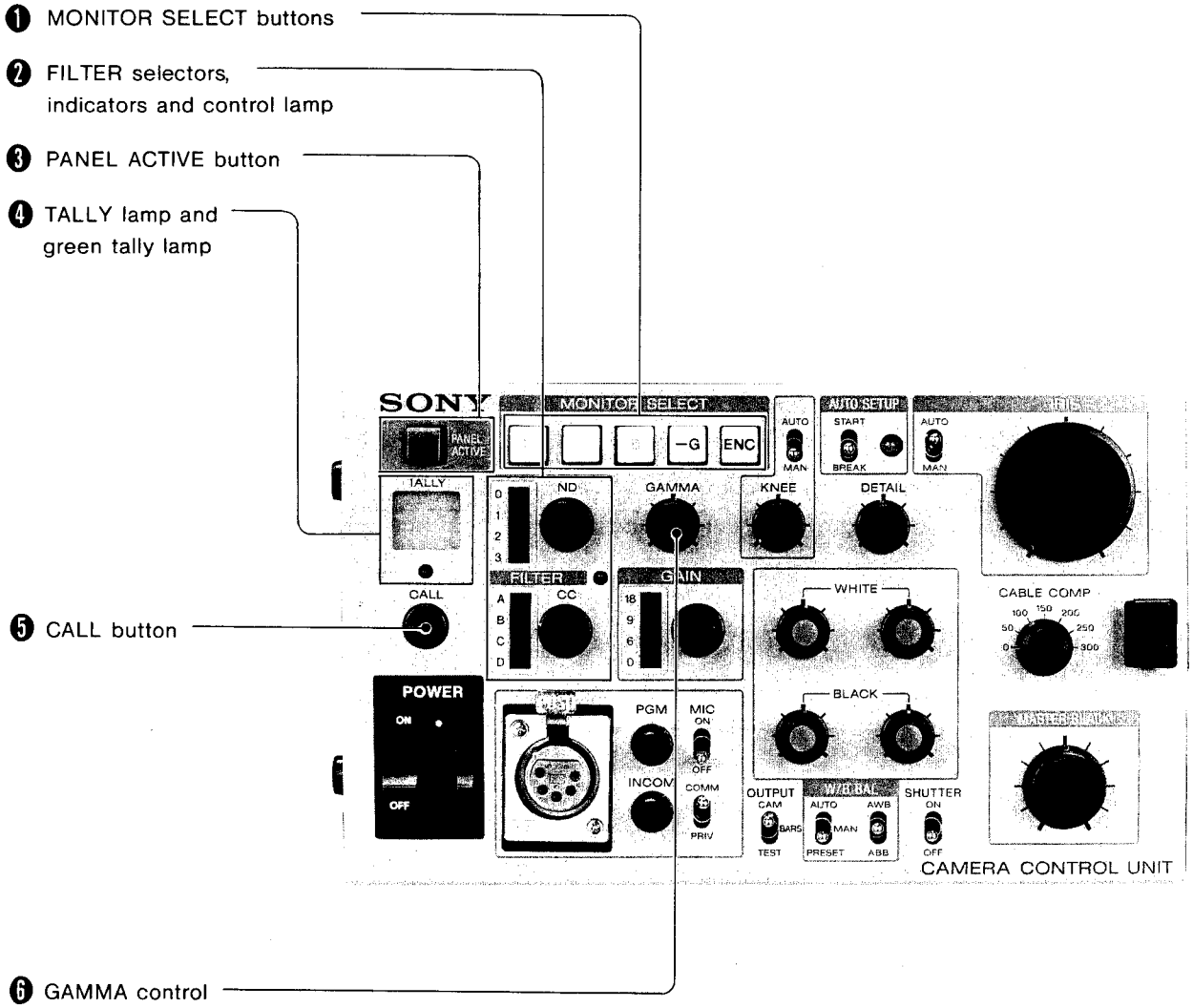
AT-65 board



S7(CONTROL)
When you use a remote control panel such as MSU or RCP, set the switch to the REMOTE position.
In this case, the switches and controls on the CCU-350 control panel cannot be used, and filter indicators, GAIN indicator and MONITOR SELECT buttons on the CCU-350 indicate the camera head settings.
When you use the front panel of the CCU, set the switch to the LOCAL position.

1-5. LOCATION AND FUNCTION OF PARTS

1-5-1. Front Panel



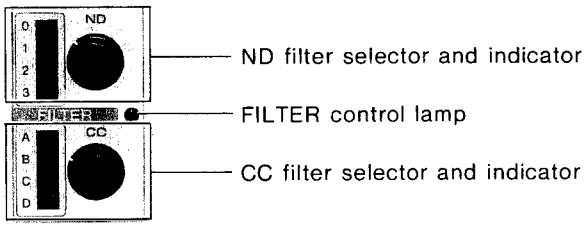
❶ MONITOR SELECT buttons

Select one of the 5 buttons (R, G, B, -G or ENC) to determine the signal to be fed to the picture monitor.

R,G,B,-G: Press one or more of these four buttons to create the composite signal. For example : R and -G = R-G signal. (G-G signal is not available.) When switch S2 (SYSTEM MODE), on the AT circuit board, is set to the 370 position, the "-G" button cannot be used.

ENC: For the encoded output signal.

❷ FILTER selectors, indicators and control lamp



When the FILTER control lamp comes on, select both a CC and an ND filter using the CC and ND selectors. When a filter has been chosen, its indicator lmap will light up.

When the FILTER control lamp is off, the selectors will not function and the filter indicators will be lit to show which filters are currently used on the camera.

- If the connected camera does not have filter indicating function, the FILTER control lamp on the CCU-350 is off and filter selectors cannot be used.

❸ PANEL ACTIVE button

When it is posisble to use the CCU-350 control panel this button will be lit. When the button is off, it is not possible to operate any controls except the MONITOR SELECT buttons.

- When switch S7 (CONTROL), on the AT circuit board, is set to the REMOTE position and the ACTIVE button is pressed, the button is not lit. Then, none of the CCU control operations can be used.

❹ TALLY lamp and green tally lamp

TALLY lamp

When lit, it indicates that the picture being taken by the camera connected to the unit is on the air or being recorded on the main VTR. This lamp also lights up when the CALL button ❺ is pressed (If the CALL button is pressed when the TALLY lamp is lit, the lamp will go off). Put the supplied camera number plate on the lamp.

Green TALLY lamp

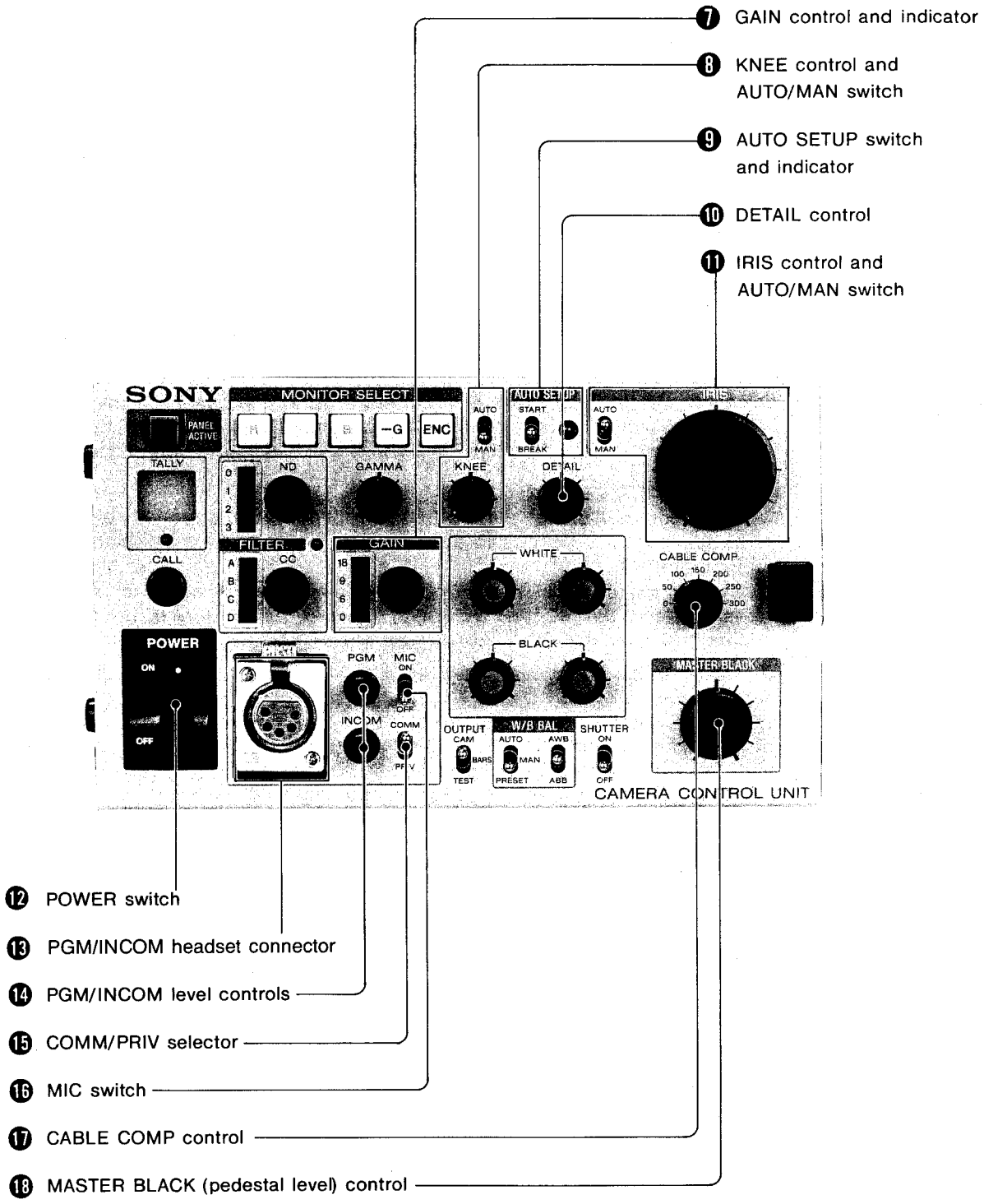
The green TALLY lamp is lit when a picture from the camera which is connected to the unit is being recorded on a sub-VTR.

❺ CALL button

While the CALL button is being pressed, both the tally lamp in the view finder of the camera and the Tally lamp of the CCU-350 are lit.

❻ GAMMA control

Adjust the master gamma of the signal.


⑦ GAIN control and indicator
⑧ KNEE control and AUTO/MAN switch
⑨ AUTO SETUP switch and indicator
⑩ DETAIL control
⑪ IRIS control and AUTO/MAN switch
SONY
MONITOR SELECT
PANEL ACTIVE
ENC
AUTO
MAN
AUTO SETUP
START
BREAK
IRIS
TALLY
ND
GAMMA
KNEE
DETAIL
CALL
FILTER
CC
GAIN
WHITE
BLACK
CABLE COMP
POWER
ON
OFF
PGM
MIC
INCOM
COMM
OUTPUT
CAM
BARS
TEST
W/B BAL
PRESET
ABB
SHUTTER
MASTER BLACK
CAMERA CONTROL UNIT
⑫ POWER switch
⑬ PGM/INCOM headset connector
⑭ PGM/INCOM level controls
⑮ COMM/PRIV selector
⑯ MIC switch
⑰ CABLE COMP control
⑱ MASTER BLACK (pedestal level) control

❼ GAIN control and indicator
The video gain can be increased up to 4 steps (0 dB, +6 dB, +9 dB and +18 dB) by turning this control dial. The gain you have selected is shown by the indicator lamps.

❽ KNEE control and AUTO/MAN switch
To adjust the knee point automatically when the light entering the camera reaches a level which is too intense, set the switch to AUTO. To adjust the knee point manually, set the switch to MAN.

❾ AUTO SETUP switch and indicator
To activate the automatic setup function of the camera, set the switch to START. When setup starts, the indicator will begin to blink and when setup is complete, the green indicator will go off a few seconds afterwards. To stop setup midway in the procedure, push the switch down to BREAK.
- The indicator lamp will also start to blink when automatic white or black balance adjustment begins. This lamp will be green when the adjustment is finished , but if the adjustment was interrupted for some reason, the indicator will blink in red.

❿ DETAIL control
Adjust the contour correction level.

⓫ IRIS control and AUTO/MAN switch
When the switch is set to AUTO, the camera lens goes into the AUTO IRIS mode. When the switch is set to MAN, the iris can be controlled using the IRIS control.
- When the switch is set to AUTO, the iris can be controlled by about 0.5 iris with the control.
- Neither the switch or the control can be used when the IRIS switch on the camera's lens unit is set to manual mode.

⓬ POWER switch
To turn the power of the CCU-350 on or off.

⓭ PGM/INCOM (program/intercom) headset connector (XLR, 5-pin, Female)
Receives program sound which is for on the air and the sound from the intercom.

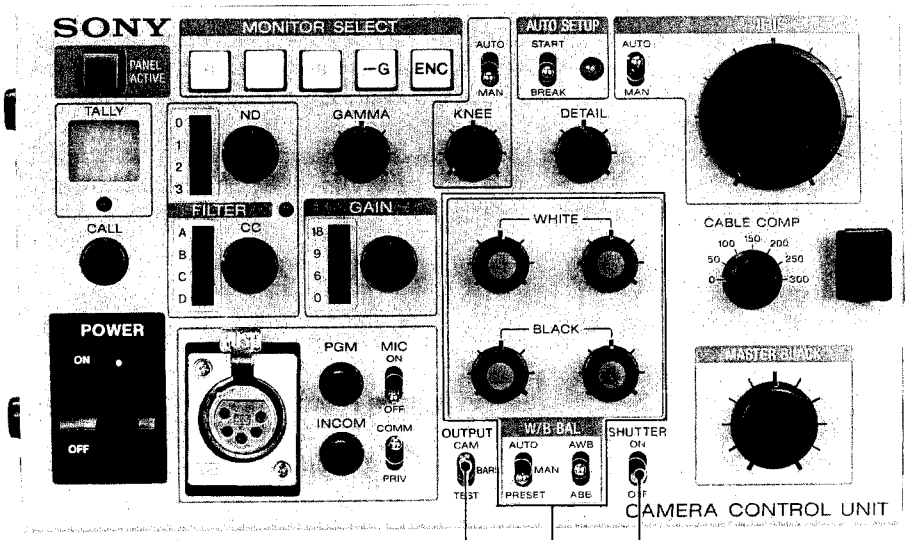
⓮ PGM/INCOM (program/intercom) level controls
Use these controls to adjust the level of the program and intercom sounds being received by the headset.

⓯ COMM/PRIV (communication/private) selector
Allows you to either connect the external intercom or to cut it off from the private intercom.
COMM: The external intercom system, which allows communication with outside units such as the control console, and the internal intercom system which allows communication between the camera and the CCU-350 unit are connected side by side.
Communication between the three units, i.e. the external system and the camera and the CCU-350 unit is possible.
PRIV: The external intercom system is cut off and communication between the camera and the CCU-350 only is possible.

⓰ MIC switch
To turn the microphone which sends the intercome voice out on or off.

⓱ CABLE COMP (cable compensation) control
Makes adjustments in the signal in order to compensate for signal difficulties which occur when a long cable is used.

⓲ MASTER BLACK (pedestal) control
Adjusts the master black level of the camera.



⑲ SHUTTER switch

⑳ W/B BAL controls and switches

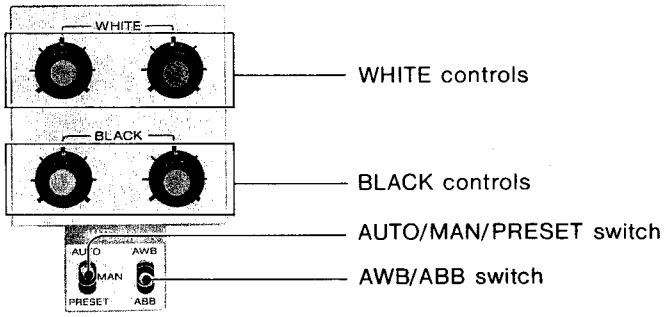
㉑ OUTPUT selector

⑲ SHUTTER switch

To turn the electric shutter of a CCD camera on or off.

- The shutter speed can be changed with the SHUTTER SPEED selector inside the front panel. For details, refer to the operation manual of the camera or camera adaptor.

⑳ W/B BAL (white/black balance) controls and switches



WHITE/BLACK controls

With the AUTO/MAN/PRESET switch set to MAN or AUTO, adjust the white balance using the WHITE controls. Black balance can be adjusted at any time with the BLACK controls. The left control adjusts the red and the right control adjusts the blue.

- After automatic white or black balance adjustment, the level is increased or dereased from the automatically adjusted level by turning the control. Turn the control clockwise to increase the level and counterclockwise to decrease the level.
- BLACK controls can be used for flare adjustment by setting the S-4 switch on the IF-177 board to ON. For details, refer to the maintenance manual.

AUTO/MAN/PRESET switch

Select how to adjust white and black balance.
AUTO: For automatic adjustment
MAN: For manual adjustment using the controls
PRESET: For the preset white balance. (Black balance can be adjusted with the controls.)

AWB/ABB (automatic white balance/automatic black balance) switch

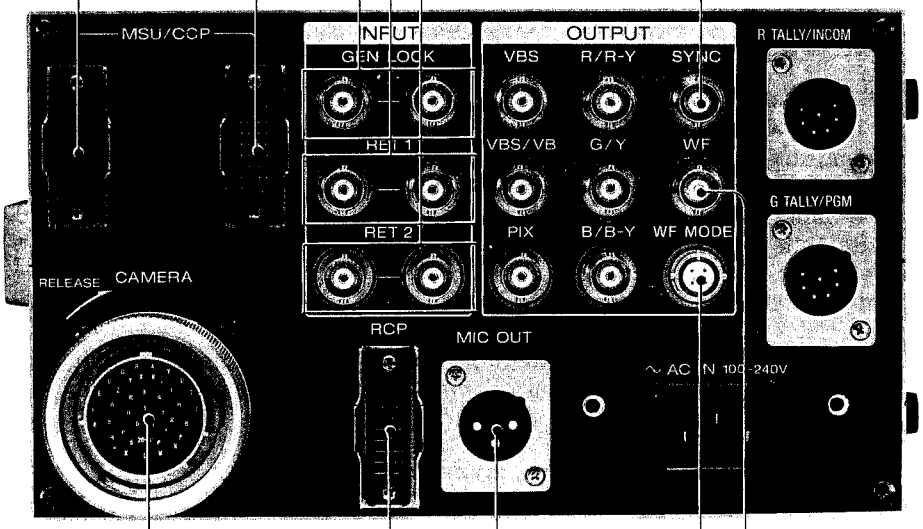
With the AUTO/MAN/PRESET switch set to AUTO, start the automatic white balance adjustment by pushing the switch up to AWB. To start the automatic black balance adjustment, push the switch down to ABB.

- Once an automatic white or black balance adjustment has begun, the AUTO SETUP lamp ⑨ starts to blink. It will be green when adjustment is finished. If automatic adjustment is interrupted or cannot be completed for some reason, the lamp will blink in red.

㉑ OUTPUT selector

Select the signals to be output from the WF OUTPUT ⑥, VBS/VB OUTPUT ⑫, VBS OUTPUT ⑬ and PIX OUTPUT ⑭ connectors. Note that when the ENC button (see MONITOR SELECT buttons) has not been depressed, the signals picked up by the camera is output from ⑥ and ⑭ connectors even if BARS is selected.
CAM: To pick up signals via the camera
BARS: To receive the color bar signal generated in the CCU-350.
TEST: To receive the camera's test signal

1-5-2. Rear Panel



1. MSU/CCP connectors
2. GEN LOCK INPUT connectors
3. RET 1 INPUT connectors
4. RET 2 INPUT connectors
5. SYNC OUTPUT connector
6. WF OUTPUT connector
7. WF MODE OUTPUT connector
8. MIC OUT connector
9. RCP connector
10. CAMERA connector

❶ **MSU/CCP (master setup unit/camera control panel) connectors** (16-pin)
Connect a MSU-360 master setup unit (optional) or a BKP-3601 camera control panel (optional) with a CCA-2A connecting cable and a CCA-1 respectively. When a BKP-3601 is connected, power will be supplied to the BKP-3601 through the connector.

- One of the two connectors is used for the bridging connection of the MSU-360.
  When a MSU-360 is connected to one connector, two or more CCU-350s can be controlled simultaneously through the bridging connection.

❷ **GEN LOCK INPUT connectors** (BNC type)
These connectors receive black burst (or VBS) signals which are used by the camera for gen-lock. When a reference signal is fed to the connectors, the camera is locked to the signal.
Without these reference signals, the camera becomes locked to its own internally generated sync signal.

❸ ❹ **RET (return video) 1/2 INPUT connectors** (BNC type)
The video signals returning from two different units can be received here. Either the RET 1 or RET 2 signal can selected for monitoring with the controls on the camera.

One of the two adjacent connectors of ❷, ❸ and ❹ is used for the bridging connection. When only one of the two is used, be sure to terminate the other by 75 ohms.

❺ **SYNC OUTPUT connector** (BNC type)
The sync signal (2 Vp-p, 75 ohms), generated by the built-in sync generator, is output here. Connect the sync signal input connector of a waveform monitor.

❻ **WF (waveform monitor) OUTPUT connector** (BNC type)
The video signal is output here for a waveform monitor. The putout signal is selected with the WAVEFORM MONITOR SELECT buttons on the BKP-3601 camera control panel or other connected controllers.

❼ **WF MODE (waveform mode) OUTPUT connector** (4-pin)
To monitor the signals in sequential mode, connect a Tektronix waveform monitor here. When the SEQ button on the BKP-3601 camera control panel or etc. is pressed, a staircase signal will be output from this connector, and the R,G and B signals can be monitored simultaneously in sequential mode.

❽ **MIC OUT connector** (XLR 3-pin)
The signals picked up by the microphone of the camera are amplified and output here. The output level can be selected with the MIC switch on the circuit board inside the CCU-350.

❾ **RCP (remote control panel) connector** (16-pin)
Connect an RCP-3620/3630 series remote control panel using a CCA-2 connecting carble here. Power and control signals are fed and supplied.

❿ **CAMERA connector** (41-pin multi-connector)
Connect a camera with a CCW-B connecting cable (optional).

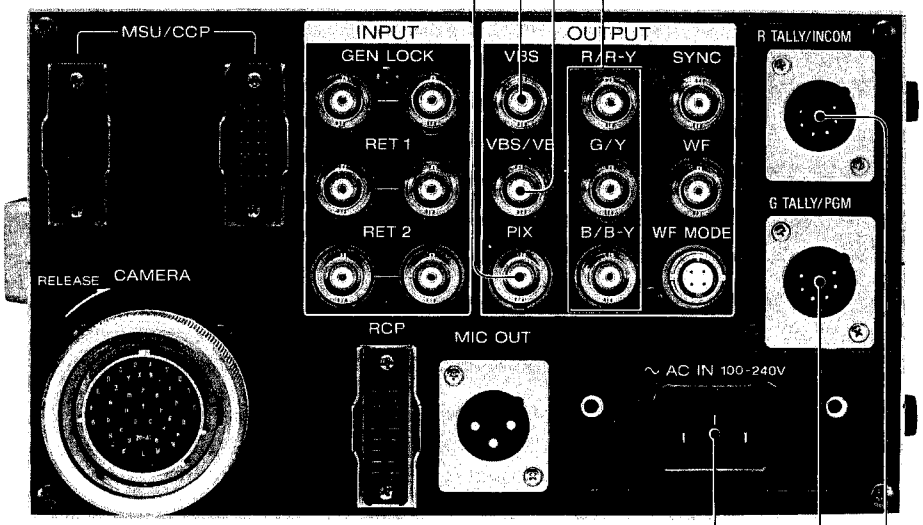
- Plug in the cable connector and rotate the coupling ring counterclockwise to secure the connection.

⓫ R/R-Y, G/Y, B/B-Y connectors

⓬ VBS/VB OUTPUT connector

⓭ VBS OUTPUT connector

⓮ PIX OUTPUT connector



⓯ AC IN power inlet

⓰ G TALLY/PGM connector

⓱ R TALLY/INCOM connector

⓫ **R/R-Y, G/Y, B/B-Y OUTPUT connectors** (BNC type)
Using the switch on the EN board, an R or R-Y, G or Y, B or B-Y signals can be selected and sent from these connectors.

⓬ **VBS/VB OUTPUT connector** (BNC type)
The signal picked up by the camera is output as a composite video signal (VBS) here. The signal can be changed into a VB signal with the switch on the EN board.

⓭ **VBS OUTPUT connector** (BNC type)
The signal picked up by the camera is output as a composite video signal (VBS) hcere.

⓮ **PIX (picture monitor) OUTPUT connector** (BNC type)
The video signal for a picture monitor is output here. The signal is selected with the MONITOR SELECT buttons on the front panel or on the BKP-3601 camera control panel, ect.

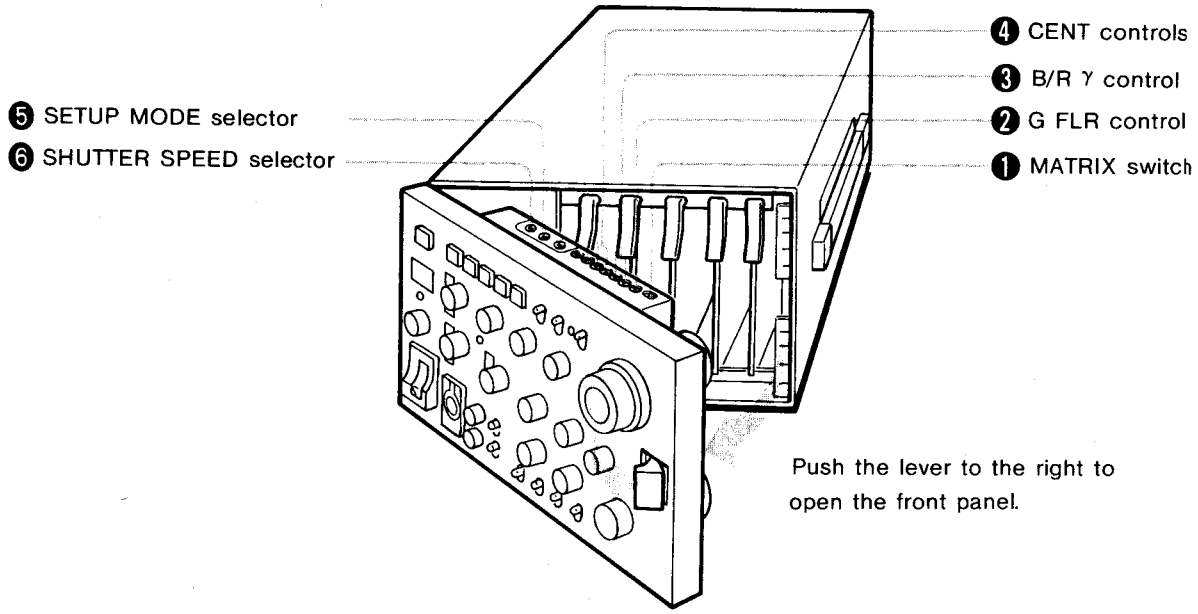
⓯ **AC IN power inlet**
Connect to an AC power source with the supplied power cord.
Fasten the plug with the plug strap.

⓰ **G TALLY/PGM (green tally/program) connector** (XLR 7-pin)
Green tally and program audio signals are input and output here. Connect a control console, or other control equipment here.

⓱ **R TALLY/INCOM (red tally/intercom) connector** (XLR 7-pin)
Red tally and intercom audio signals are input and output here.
Connect a control console, or other control equipment here.

1-5-3. Inside the Front Panel

For details on the switches and controls, refer to the maintenance manual.


❹ CENT controls
❸ B/R γ control
❷ G FLR control
❶ MATRIX switch
❺ SETUP MODE selector
❻ SHUTTER SPEED selector
Push the lever to the right to open the front panel.

❶ MATRIX switch
Turn the linear matrix circuit of the connected camera off and on. (This switch can be used only when the camera itself has a switch to turn the circuit off and on.)

❷ G FLR (G flare) control
Adjust the G flare. (To utilize this control, set the S-4 switch on the IF-177 board to ON. When the switch is set to OFF, the G FLR control cannot be used.)
- When the S-4 switch on the IF-177 is set to ON, the R and B flare can be adjusted with the BLACK controls on the front panel.

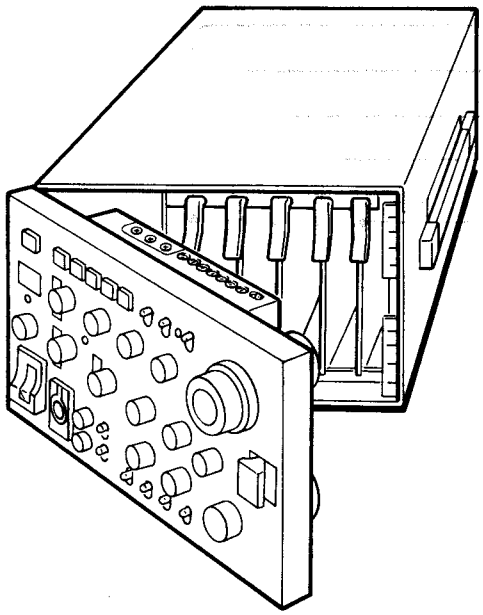
❸ B/R γ (B/R gamma) control
Adjust the gamma of the B signal with the left control and the gamma of the R signal with the right control.

❹ CENT (centering) controls
Registration is adjusted horizontally with the left control and vertically with the right control. To adjust the R signal, select R-G with the MONITOR SELECT buttons on the front panel, and to adjust the B signal, select B-G. (When another is selected, the CENT controls cannot be used.)
- These controls cannot be used when a CCD camera is connected to the unit.

❺ SETUP MODE selector
Selects the automatic setup mode.

❻ SHUTTER SPEED selector
Select the shutter speed for the electronic shutter of the connected CCD camera.

1-5-4. Internal Circuit Boards



AT board [1]
SG board [2]
EN board [3]
VA board [4]
AU board [5]

Each board has the following switches and controls.
For details, refer to the maintenance manual.

AT board [1]

TRIAX TEST switch	Leave this switch set to OFF.
GRP No. selector	Selects the group number for using the master setup unit.
CCU No. selector	Selects the camera number for using the master setup unit.
PHASE switch	Select remote or local operation of the H/SC phase control. **REMOTE:** Control the phase using remote control panel. **LOCAL:** Control the phase using the H/SC phase control on the AT circuit board
H/SC (H sync/subcarrier) PHASE controls	With the H PHASE control, adjust the horizontal sync phase of the output signal with respect to the signal fed to the GEN LOCK INPUT connector, and with SC PHASE control, adjust the subcarrier phase.
SC(subcarrier) STEP switch	Shifts the subcarrier phase by 90° .

SG board [2]

HBL control	Adjust the width of the H blanking.
VBL selector	Selectors the width of the V blanking.
SC FREQ control	Adjusts the subcarrier frequency.
H PHASE control	Adjusts the horizontal sync phase of the output signal. This control is used for fine.
CHU LOCK indicator	Lights up when the connected camera is turned on.
EXT LOCK indicator	Lights up when the externally supplied sync signal is being used.

EN board [3]

I/Q BAL controls	Adjust the balance of the I and Q signals.
LEVEL controls	Adjust the level of the chroma, luminance and sync signals.

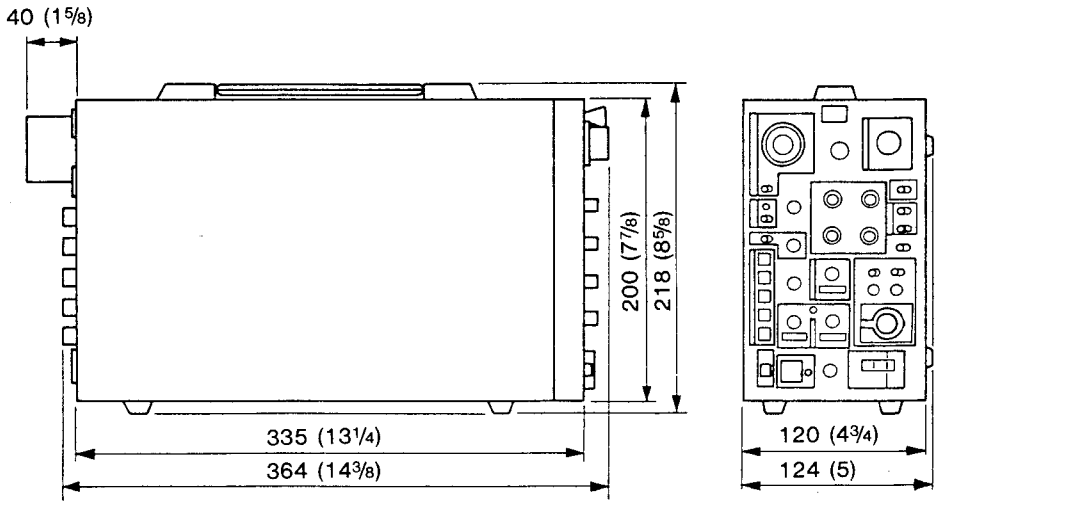
AU board [5]

SIDE TONE control	Adjusts the level of the side tone of the intercom.
CANCEL control	Adjusts to minimize the level of your own voice which returns to the CCU-350 through the intercom when an RTS or 2-wire type intercom is used.

1-6. SPECIFICATIONS

Power requirements	AC100V±10% to 240V±10% 50/60Hz
Power consumption	135W (MAX)
Output signals	VIDEO OUT 1.0 Vp-p, VBS, 75 ohms (BNC type ×1) 1.0 Vp-p, VBS/VB selectable, 75 ohms (BNC type ×1) R, G, B OUT (BNC type ×3) 0.7 Vp-p, V, 75 ohms MONITOR OUT (BNC type ×1) R, G, B, -G composite signals or encoder output signal 1.0 Vp-p, VS/VBS, 75 ohms WAVEFORM OUT ENCODER OUT: 1.0 Vp-p, VBS, high impedance R OUT: 0.7 Vp-p, V, 75 ohms G OUT: 0.7 Vp-p, V, 75 ohms B OUT: 0.7 Vp-p, V, 75 ohms SYNC OUT: 0.3 Vp-p, 75 ohms MIC OUT (XLR 3-pin, male) 0 dB/−20 dB (selectable) impedance 600 ohms
Control items	Iris (auto/manual) White balance (auto/manual) Black balance (auto/manual) White (R/B) Black (master/R/B) Centering (R/B-horizontal, R/B-vertical) Gain select (0 dB/+6 dB/+9 dB/+18 dB) Mode select (camera/bars/test) Incom select (common/private) Detail (ON/OFF) Phase (H/SC) Cable compensation Tally call
Cable compensation	0/50/100/150/200/250/300 m (selectable in 7 stages): 5.5 MHz ±0.5 dB 400/500/600m (selectable in 3 stages): 4.0 MHz ±1 dB
Gen-lock	Horizontal phase adjustable range: +3 μsec to −1.5 μsec or more (with respect to input phase) SC phase adjustment range: 360° Coupling accuracy: H: Within ±0.01 μsec SC: Within ±1°
Iris adjustment	Close ◄► open, auto/manual selectable (At auto, fine adjustment possible)

Master BLACK adjustment	More than ±30% of rating
R/B WHITE adjustment	More than ±20% of rating
R/B BLACK adjustment	More than ±10% of rating
Tally/call	Contact and power supply (DC 12V/24V)
Intercom	4-wire: INPUT 0 dBs, balanced OUTPUT 0 dBs, balanced 2-wire: INPUT 0 dBm, 600 ohms, balanced OUTPUT 0 dBm, 600 ohms, balanced RTS: −10 dBs, 200 ohms
Program audio in	0/−20 dBs, balanced
Ambient operating temperature	−10°C to +40°C
Dimensions	218(W) × 124(H) × 364(D) mm (8⅝ × 5 × 14⅜ inches) including projecting parts
Weight	6.5 kg (14 lb 5.3 oz)
Supplied accessories	Power cord (1) Extension board (1) Camera number plate (1) Operation and maintenance manual (1)
Optional accessories	Camera cable (41-pin, 34-core) CCW-B-25(25m) CCW-B-50(50m) CCW-B-100(100m) Rack mount adapter (RMM-301) Camera adapter CA-3512, CA-50 Remote control panel RCP-3710 RCP-3720 RCP-3730 Master setup unit MSU-350/370

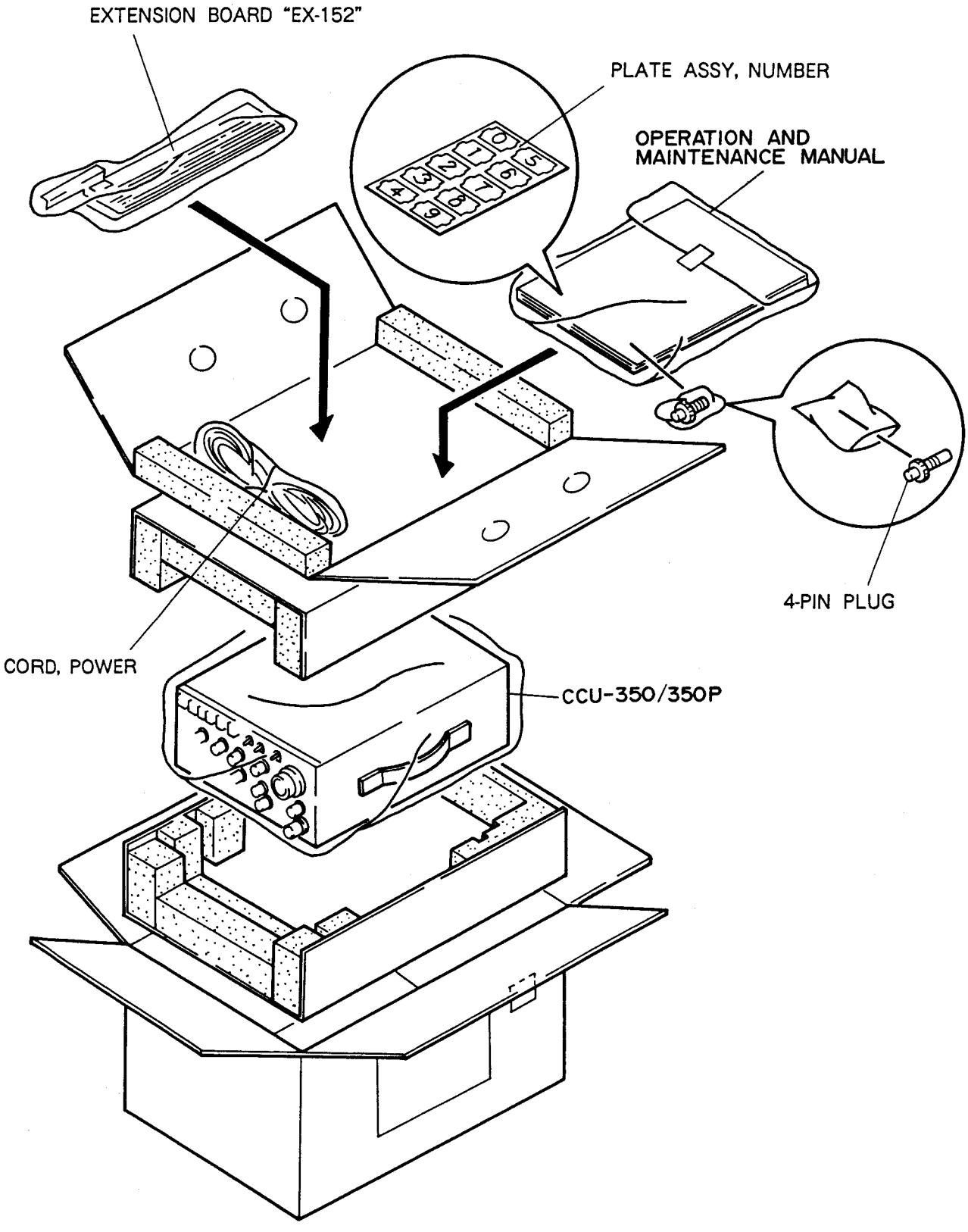


Unit: mm (inches)

Design and specifications subject to change without notice.

SECTION 2
INSTALLATION

2-1. UNPACKING AND REPACKING

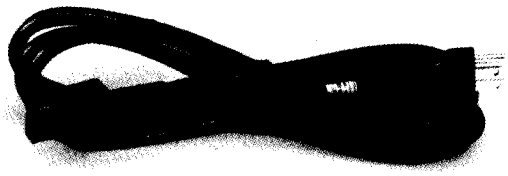


2-2. SUPPLIED ACCESSORIES

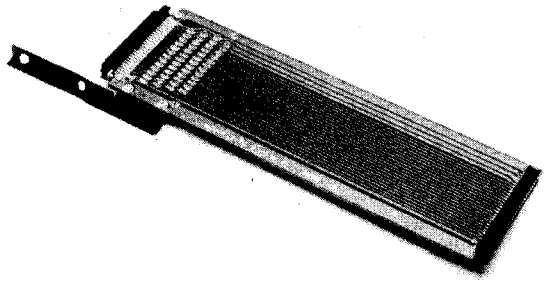
Cord, Power : ×1
There are 2.4-meter cords used to supply power to the CCU-350/350P.

(For CCU-350)

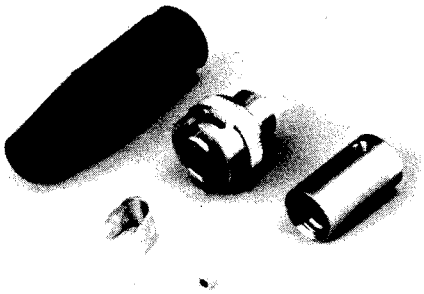
(For CCU-350P)



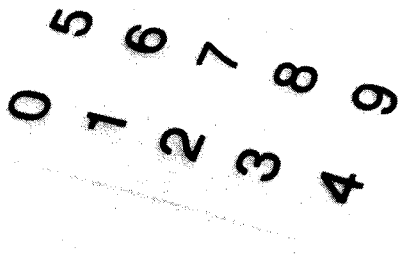
EX-152 (Extension Board) : ×1
Use this for the check and repair of the main printed circuit boards.



4-pin plug connector : ×1
Available for connection to the waveform monitor of TEKTRONIX' make or equivalent.



Plate, Number : ×1



OPERATION AND MAINTENANCE MANUAL : ×1
Instruction manual and service manual for CCU-350/350P.

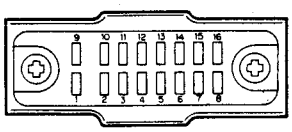
2-3. CONNECTORS/CABLES

2-3-1. Connector Input/Output Signals

The main connector Input/Output Signals are as follows.

- GEN LOCK IN : BNC-type 75 Ω
  (VBS or BS)
- RET 1 IN : BNC-type 75 Ω
  1.0Vp-p
- RET 2 IN : BNC-type 75 Ω
  1.0Vp-p
- SYNC OUT : BNC-type 75 Ω
  0.3Vp-p
- WF OUT : BNC-type 75 Ω
  714mVp-p
- R/R-Y OUT : BNC-type 75 Ω
  R=700mVp-p/1.0Vp-p
  R-Y=700mVp-p (CCU-350)
  525mVp-p (CCU-350P)
- G/Y OUT : BNC-type 75 Ω
  G=700mVp-p/1.0Vp-p
  Y=700mVp-p/1.0Vp-p
- B/B-Y OUT : BNC-type 75 Ω
  B=700mVp-p/1.0Vp-p
  R-Y=700mVp-p (CCU-350)
  525mVp-p (CCU-350P)
- VBS OUT : BNC-type 75 Ω
  1.0Vp-p
- VBS/VB OUT : BNC-type 75 Ω
  1.0Vp-p/714mVp-p
- PIX OUT : BNC-type 75 Ω
  1.0Vp-p

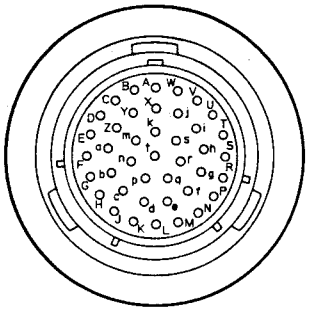
"MSU/CCP"
(16P, FEMALE)



(EXT VIEW)

Pin No	SIGNAL	REMARK for SIGNAL
1	GND chassis	chassis GND
2		
3	PNL DATA OUT (X)	CCU SERIAL DATA OUTPUT
4	PNL DATA OUT (Y)	
5	PNL DATA OUT (G)	
6	MSU DATA IN/OUT (X)	MSU ⇄ CCU SERIAL DATA
7	MSU DATA IN/OUT (Y)	
8	MSU DATA (G)	
9	REG (+24V) OUT	CONTROL PANEL POWER +24V DC
10	GND (+24V)	
11	PNL DATA IN (X)	CONTROL PANEL DATA INPUT
12	PNL DATA IN (Y)	
13	PNL DATA IN (G)	
14	SEQ SYNC IN (X)	SEQ CONTROL INPUT
15	SEQ SYNC IN (Y)	
16	SEQ SYNC IN (G)	

"CAMERA"
(41P, FEMALE)

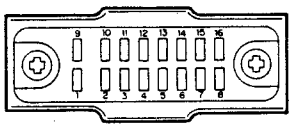


(EXT VIEW)

Pin No	SIGNAL	REMARK for SIGNAL
A	POWER SENS (−)	+20V 2.5A
B		
C		
D		
E		
F	CHU PGM OUT (G)	GND for CHU PGM OUT
G		
H	RET OUT (G)	GND for RET OUT (X)
J		
K	CHU MIC IN (Y)	−20dBs Balanced
L	CHU MIC IN (G)	GND for CHU MIC IN
M	H CONT OUT	0∼5V
N	CAM DATA IN (X)	2.5Vp-p
P	CAM DATA/CCU DATA IN (G)	CAM↔CCU SERIAL DATA
R	CCU INCOM IN (Y)	−20dBs Balanced
S	INCOM IN/OUT (G)	GND for INCOM
T	G IN (G)	V : 0.7Vp-p 75 Ω
U		
V	B IN (G)	V : 0.7Vp-p 75 Ω
W		
X	R IN (G)	V : 0.7Vp-p 75 Ω
Y	POWER SENS (+) IN	+20V 2.5A
Z		

Pin No	SIGNAL	REMARK for SIGNAL
a	CHU PGM OUT (X)	−20dBs Balanced
b	CHU PGM OUT (Y)	
c	RET OUT (X)	1.0Vp-p, 75 Ω
d	CHU MIC IN (X)	−20dBs Balanced
e	CCU DATA OUT (X)	2.5Vp-p
f	CHU INCOM OUT (X)	−20dBs Balanced
g	CHU INCOM IN (X)	−20dBs Balanced
h		
i	G IN (X)	1.0Vp-p, 75 Ω
j	B IN (X)	
k	R IN (X)	
m		
n	POWER (+) OUT	+16V 2.5A
p		
q	CHU INCOM OUT (Y)	−20dBs Balanced
r	POWER (−) OUT	+16V 2.5A
s		
t		

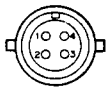
"RCP"
(16P, FEMALE)



(EXT VIEW)

Pin No	SIGNAL	REMARK for SIGNAL
1	GND (chassis)	chassis GND
2	GND (RCP)	
3	NC	Non connection
4	NC	
5	NC	
6	RCP DATA OUT (X)	CCU SERIAL DATA OUTPUT
7	RCP DATA OUT (Y)	
8	RCP DATA OUT (G)	
9	+24V OUT	RCP POWER +24V DC
10	GND (+24V)	
11	NC	Non connection
12	NC	
13	NC	
14	RCP DATA IN (X)	RCP SERIAL DATA INPUT
15	RCP DATA IN (Y)	
16	RCP DATA IN (G)	

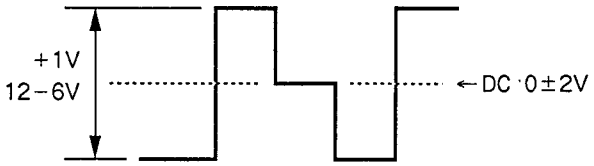
"WF MODE"
(16P, FEMALE)



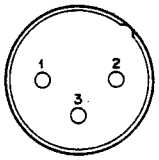
(EXT VIEW)

Pin No	SIGNAL	REMARK for SIGNAL
1	GND	OPEN COLLECTOR
2	SEQ CONT OUT	
3	STAIR CASE OUT	Note 1)
4	GND	chassis GND

Note 1) Stair Case signal



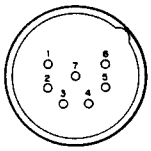
"MIC OUT"
(3P, MALE)



(EXT VIEW)

Pin No	SIGNAL	REMARK for SIGNAL
1	MIC OUT (G)	0dBs/−20dBs
2	MIC OUT (X)	
3	MIC OUT (Y)	

"R TALLY/INCOM"
(7P, MALE)



(EXT VIEW)

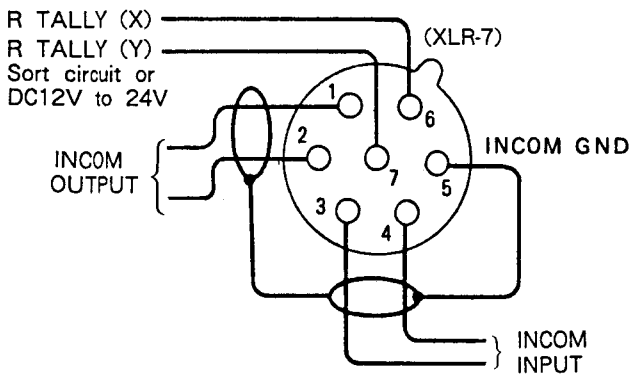
4-wire system
* (Selected on AU-98 board)

Pin No	SIGNAL	REMARK for SIGNAL
1	4W INCOM OUT (X)	0dBs Zi≧10k Ω
2	4W INCOM OUT (Y)	
3	4W INCOM IN (X)	
4	4W INCOM IN (Y)	
5	4W INCOM IN/OUT (G)	
6	R TALLY (X) IN	DC±12~24V or CONTACT
7	R TALLY (Y) IN	

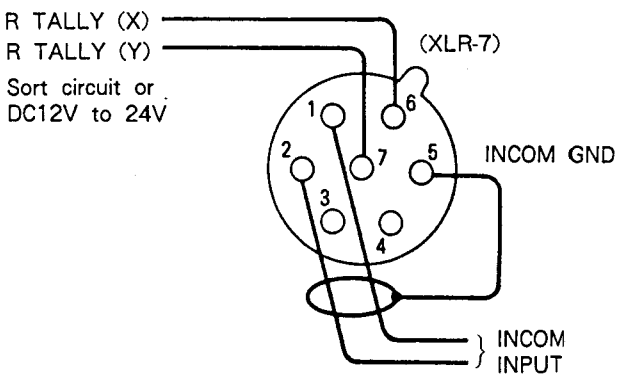
2-wire system
* (Selected on AU-98 board)

Pin No	SIGNAL	REMARK for SIGNAL
1	2W INCOM OUT (X)	0dBm, 600 Ω
2	2W INCOM OUT (Y)	
3	2W INCOM IN (X)	
4	2W INCOM IN (Y)	
5	2W INCOM IN/OUT (G)	
6	R TALLY (X) IN	DC±12~24V or CONTACT
7	R TALLY (Y) IN	

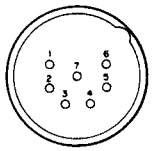
R TALLY/INCOM connector wiring diagram



R TALLY/INCOM connector wiring diagram



"G TALLY/PGM"
(7P, MALE)



(EXT VIEW)

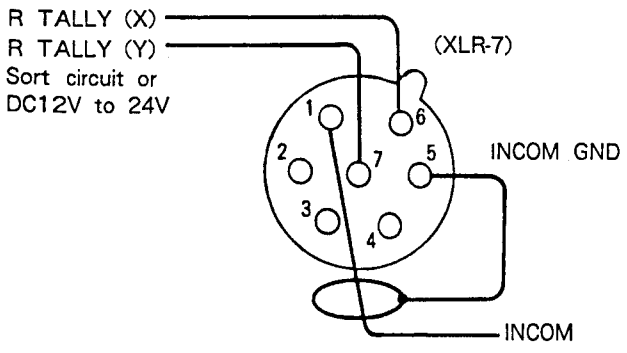
RTS system
* (Selected on AU-98 board)

Pin No	SIGNAL	REMARK for SIGNAL
1	RTS INCOM OUT (X)	−10dBs, 200 Ω
2	RTS INCOM OUT (Y)	
3	RTS INCOM IN (X)	
4	RTS INCOM IN (Y)	
5	RTS INCOM IN/OUT (G)	
6	R TALLY (X) IN	DC±12~24V or CONTACT
7	R TALLY (Y) IN	

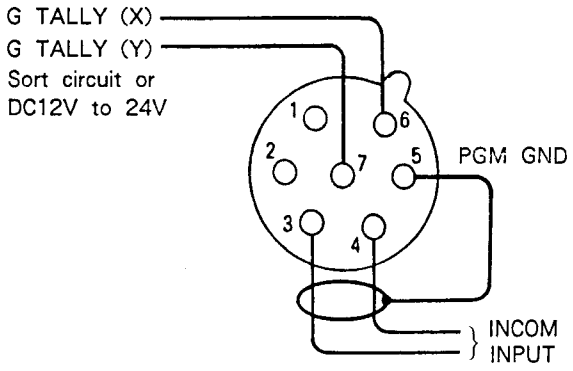
* (Selected on AU-98 board)

Pin No	SIGNAL	REMARK for SIGNAL
1		
2		
3	PGM IN (X)	0dBs/−20dBs
4	PGM IN (Y)	
5	PGM IN (G)	
6	G TALLY (X) IN	DC±12~24V or CONTACT
7	G TALLY (Y) IN	

R TALLY/INCOM connector wiring diagram



G TALLY/PGM connector wiring diagram



2-3-2. Connections

When cables with connectors are set to the respective connectors on the connector panel during installation or service, the specified or equivalent connectors with cables, on the specified cable assemblies should be used, these are listed as follows :

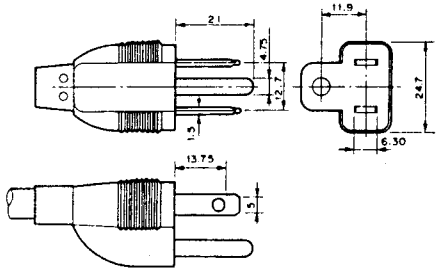
Connector function	Parts No. and name of connector with cable
GEN LOCK INPUT RET-1 INPUT RET-2 INPUT SYNC OUTPUT WF OUTPUT WF MODE OUTPUT R/R-Y OUTPUT G/Y OUTPUT B/B-Y OUTPUT VBS OUTPUT PIX OUTPUT (BNC)	1-560-069-11 PLUG BNC or B-B Cable assembly (Cable length 1.5m optional)
MSU CCU RCP (16P, FEMALE)	1-564-970-11 PLUG, 16P, MALE (P-1616G-C or equivalent)
WF MODE (4P, FEMALE)	1-560-343-00 PLUG, 4P, MALE (Supplied)
MIC OUT (XLR-3P, MALE)	1-508-084-11 XLR-3-12C, 3P, FEMALE
CAMERA (41P, FEMALE)	1-560-332-00 41P, CONNECTOR (P-M), FEMALE
R TALLY/INCOM G TALLY/PGM (XLR-7P, MALE)	1-508-366-11 XLR-7-11C, 7P, FEMALE

2-4. POWER SUPPLY

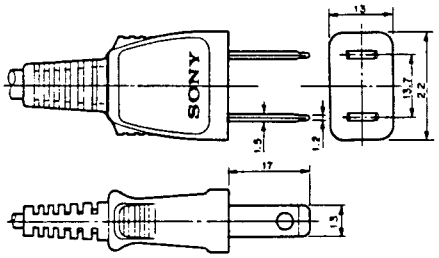
Power sources : AC 100V~240V±10%
Power frequency : 50/60Hz
Power consumption : 135W (MAX)

Cord, power

3P-plug (For CCU-350P)
Cable length about 2.4m
Rated voltage 125V
Rated current 10A



2P-plug (For CCU-350)
Cable length about 2.4m
Rated voltage 125V
Rated current 10A



2-5. OPERATIONAL ACCESSORIES

- Camera Cable (41P, 34 core)
  CCWB-25 (25m)
  CCWB-50 (50m)
  CCWB-100 (100m)
  This is camera cable for connecting the camera and CCU-350/350P.

- Rack Mount Adaptor
  RMM-301
  This is rack mount adaptor for installing CCU-350/350p in the 19-inch rack. Be able to install two CCU-350/350P.

- Camera Adaptor
  CA-3512
  This is camera adaptor for attaching to BVP-350/350P.
  CA-50
  This is camera adaptor for attaching to BVP-50/50P.

- Remote Control Panel
  RCP-3620/A
  RCP-3621/A
  RCP-3630
  RCP-3631/A

- Master Setup Unit
  MSU-360

- Camera Operational Control Unit
  OCU-3610
  OCU-3620

- Camera Operating Software
  BZP-3621 NEC (PC-9801 series)
  BZP-3611 ＊IBM (＊＊IBM PC)

＊ IBM is a registered trademark of International Business Machines Corporation.
＊＊IBM PC is a trademark of International Business Machines Corporation.

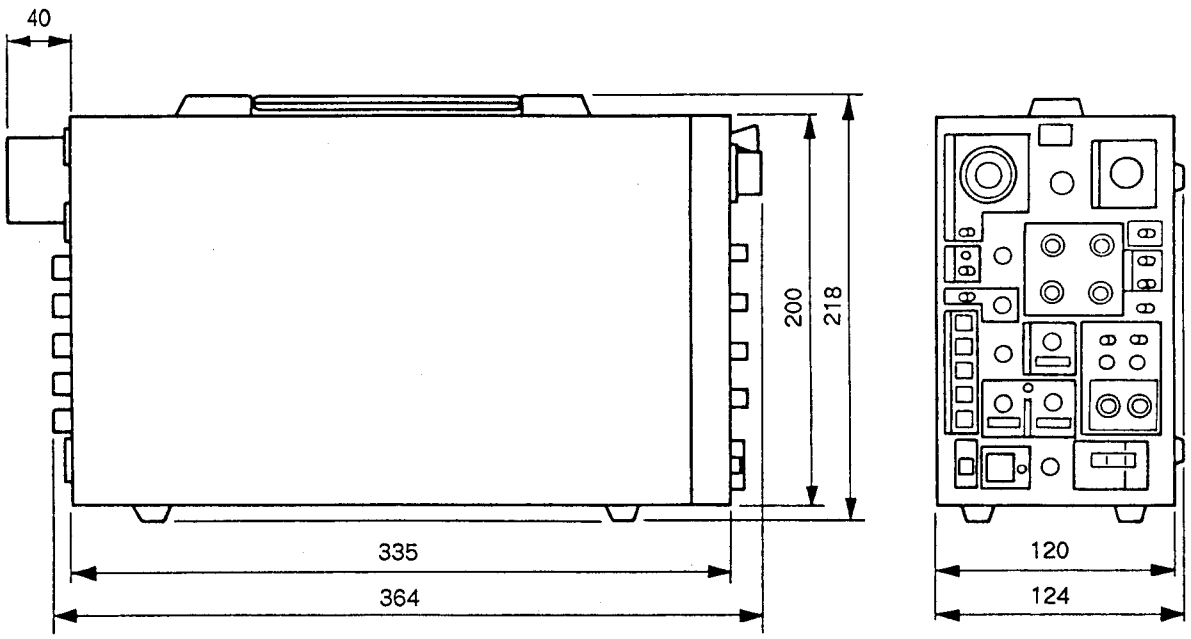
2-6. INSTALLATION

2-6-1. Installation Conditions

Operating temperature : −10℃ to +45℃
Storage temperature : −20℃ to +50℃
Humidety : Non condense

1. Do not install near a heat source as a power supply.
2. Do not install in a intense electric or magnetic fields.
3. Install the unit in a location which is dry and sell ventioated as possible.
4. Avoid using the camera in locations where it will be subjected to violent vibration.

2-6-2. Outside Dimension



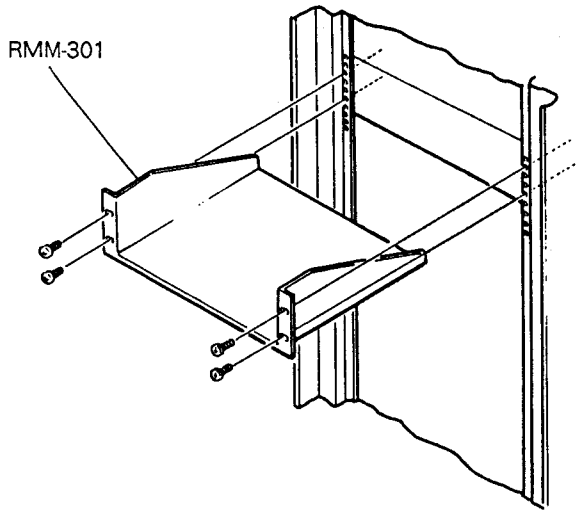
Unit : mm

2-6-3. How to Attach to Rack Mount

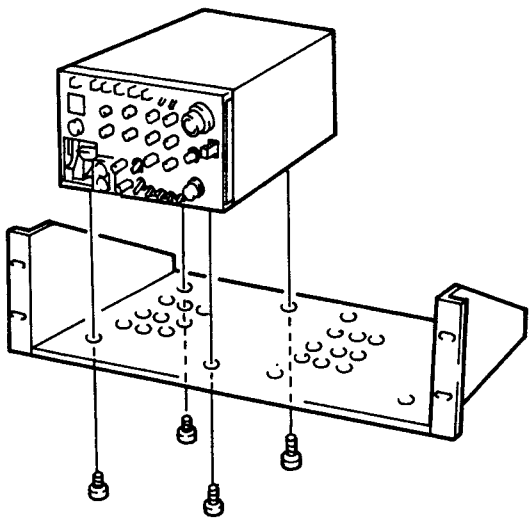
When mounting the CCU-350/350P in the 19-inch rack, use the rack mount adaptor RMM-301 (optional). Be able to install the two CCU-350/350P on the rack mount adaptor.

How to attach to 19-inch rack

1. Attach the rack mount adaptor by fixing the four screws.



2. Install the CCU-350/350P on the rack mount adaptor and fix it by using the four screws (supplied with RMM-301) as follows.



2-7. INITIAL SETTING OF SWITCH

(1) AT-65 Board

• S1 (TRIAX TEST)
Set the switch to OFF.

• S2 (SYSTEM MODE)
Set the switch to 370.
When using the tube camera system MSU-360, etc., set the switch to "360".
Normally set to "370".

• S3 (GROUP SELECT)
When connecting more than nine CCUs to the MSU, this switch selects the group number of the CCU to connect to the VCS-350 used in the SUB mode (expansion mode). The VCS in the SUB mode is connected to the main VCS-350 or VCS-370, and the group number of the CCU is selected according to the connector numbers to be connected at that time.

Input channels of VCS	Setting position of S3
8/A (MSU-350/370)	1
7/B (MSU-370)	2
6/C (MSU-370)	3
5/D (MSU-370)	4

Normally set to "0".

• S4 (CAMERA SELECT)
Set the switch to input channel of the master setup unit VCS-350/370.
Normally set to "0".

• S5 (BUZZER)
When setting the switch to ON, the buzzer in the CCU-350/350P sounds by pressing the CALL button on the camera.

• S6 (TERMINATION)
Set this switch when the CCU is controlled by the MSU.
The MSU, CCU, and VCS are in the chain connection through the MSU/CCU connectors.
Two connectors of each machine are looped through inside the machine and are required to be terminated at both ends of the chain connection.
When the CCU is the last machine of the chain connection, set the switch to ON, otherwise to OFF.
Normally set to "OFF".

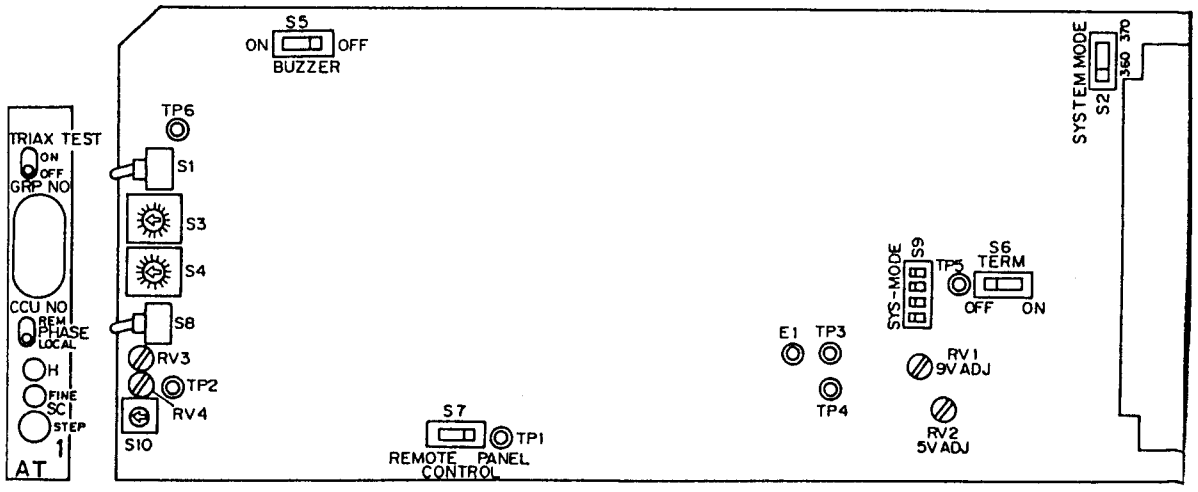
• S7 (CONTROL)
When controlling the CCU on the front panel, set the switch to PANEL. When controlling the CCU on the other remote panels, set the switch to REMOTE. When REMOTE is selected, disables the control on the front panel. (Display system is able.)
Normally set to PANEL.

• S8 (PHASE)
Selects the H/SC phase control to REMOTE or LOCAL.
When set to REMOTE, the CCU can be controlled on the remote control panel, etc.
When set to LOCAL, the CCU can be controlled on the AT board.

• S9 (SYS MODE)
Not used

• S10 (SC STEP)
When the phase control is set to LOCAL, the SC phase can be shifted by 90° .

RV3 and RV4 (H/SC PHASE)
When the phase control is set to LOCAL, the H/SC phase can be controlled.

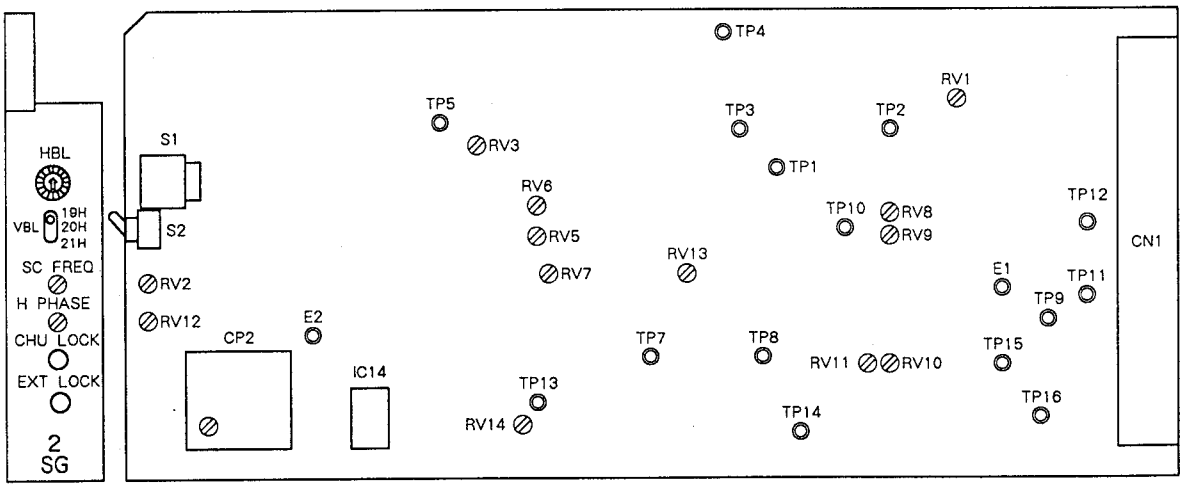


AT-65 BOARD (Component Side)

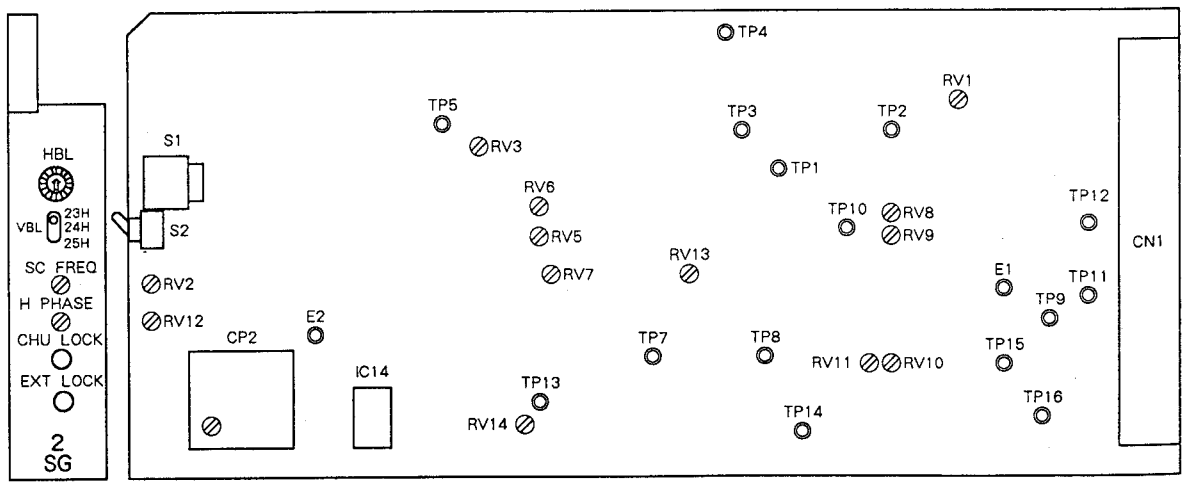
(2) SG-131 Board

• S1 (H BLKG)
Adjust the horizontal blanking pulse width.
Normally set to 10.9±0.2 μs (NTSC) /12.05±0.2 μs (PAL).

• S2 (V BLKG)
Adjust the vertical blanking pulse width.
Normally set to 20H (NTSC) /24H (PAL).



SG-131 BOARD (Component Side)



SG-131P BOARD (Component Side)

(3) EN-64 Board

• S1 (I)
When turned on the switch, the I signal is added to the encoder circuit. Use for the encoder circuit adjustment.
Normally set to "ON".

• S2 (Q)
When turned on the switch, the Q signal is added to the encoder circuit. Use for the encoder circuit adjustment.
Normally set to "ON".

• S3 (COLOR BARS)
This switch is used for selecting the color bar output signal from the CCU in accordance with the switch positions such as "SMPTE", "FULL FIELD" or "EIA".
Normally set to "SMPTE" position.

• S4 (G/Y SYNC)
When turned on the switch, the G signal or the Y signal is added to the SYNC signal.
Normally set to "OFF".

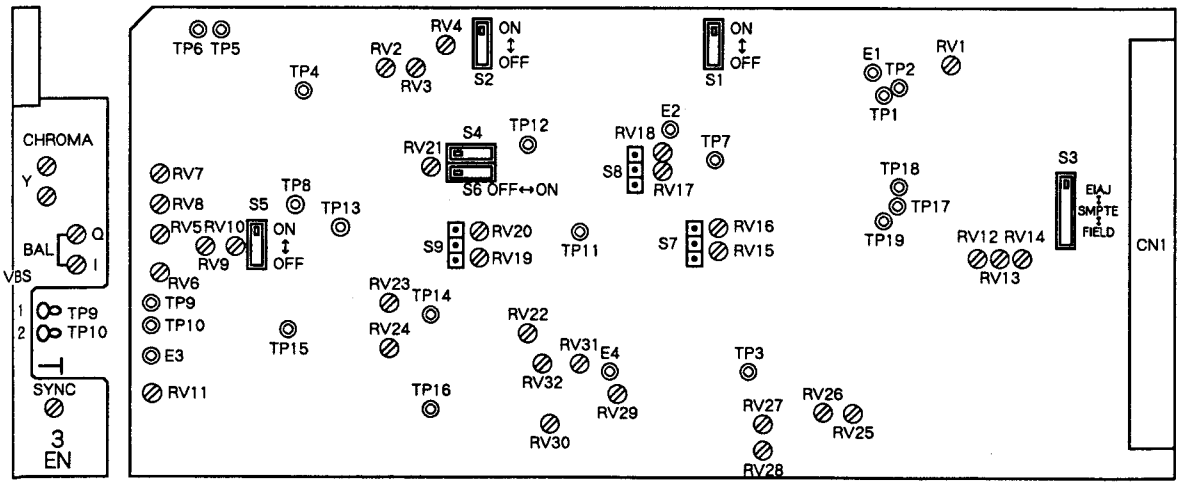
• S5 (VIDEO SYNC)
When turned on the switch, the VBS/VB output signal on the rear panel is added to the SYNC signal as VBS signal.
Normally set to "ON".

• S6 (R/R − Y B/B − Y SYNC)
When turned on the switch, the R/R − Y signal and the B/B − Y signal on the rear panel is added to the SYNC signal.
Normally set to "OFF".

• S7 (B/B − Y)
The B signal or the B − Y signal is selected by the short plug.
Normally set to "B" side.

• S8 (R/R − Y)
The R signal or the R − Y signal is selected by the short plug.
Normally set to "R" side.

• S9 (G/Y)
The G signal or the Y signal is selected by the short plug.
Normally set to "G" side.

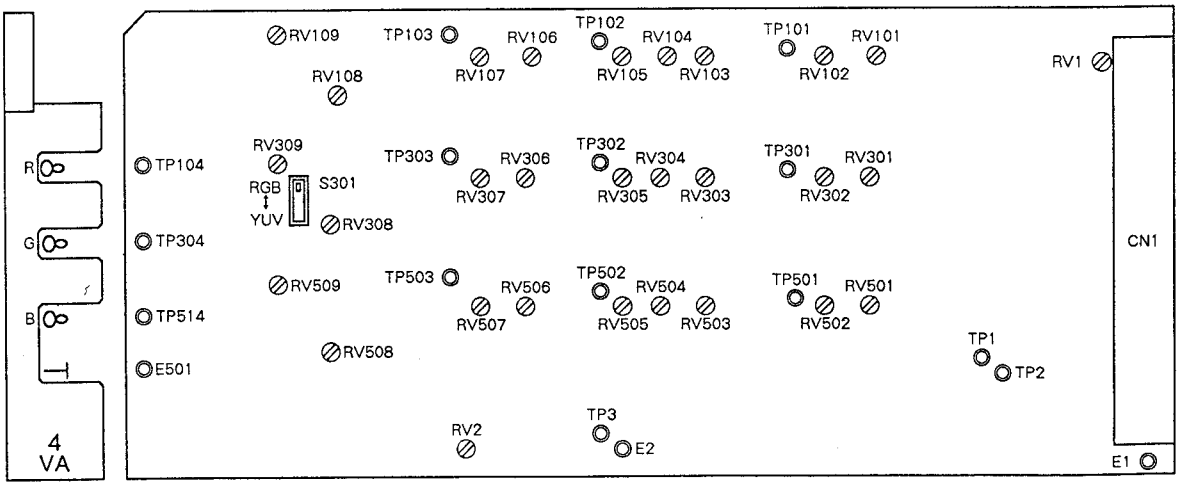


EN-64/64P BOARD (Component Side)

(4) VA-63 Board

• S301 (RGB/YUV)
Select either the RGB signal or the YUV signal.
When using the BVP-350/350P and the CA-3512, set to RGB.
When using a YUV signal as the BVP-50/50P and the CA-50/50P, etc., set to YUV.
Serial No. Up to 21010 (For UC).
Serial No. Up to 30730 (For EK).
Factory set the switch to RGB.

Serial No. 21011 and higher (For UC).
Serial No. 30731 and higher (For EK).
Factory set the switch to YUV.



VA-63 BOARD (Component Side)

(5) AU-98 Board

• S1 (MIC GAIN)
This switch is used to set the gain of the microphone to 0dB or −20dB.
Normally set to 0dBs.

• S2 (PGM ATT)
This switch is used to set the gain of the program audio input signal to 0dB or to −20dB.
Normally set to −20dB.

• S3 (INCOM SELECT)
This switch is used to set the input impedance of the microphone either a carbon or a dynamic.
Normally set to CARBON.

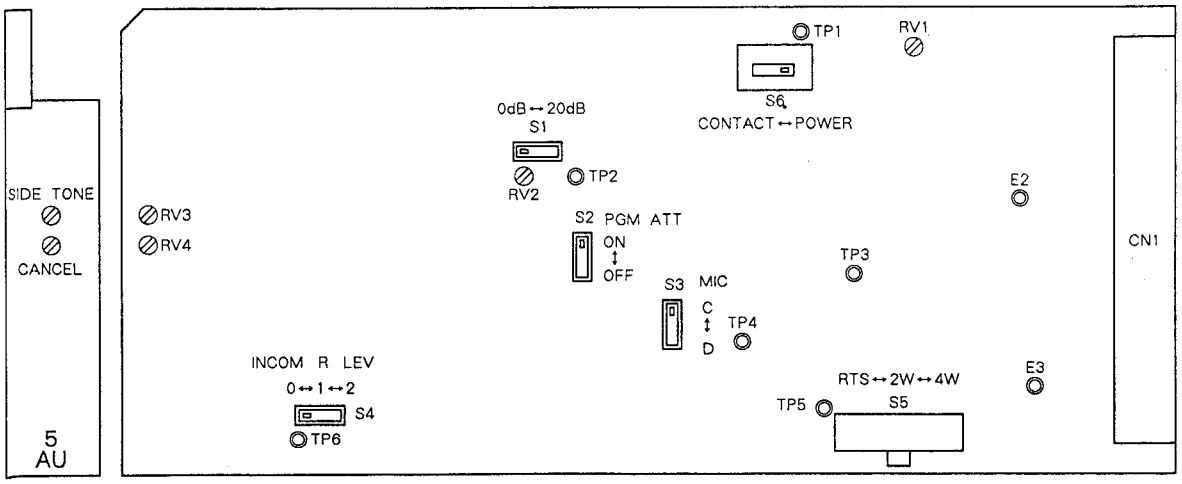
• S4 (INCOM R LEV)
This switch is used to set the gain of the intercommunication receiving signal either to 0 or to 1 or to 2. One step is 10dB.
Normally set to "0".

• S5 (RTS/2W/4W)
This switch is used to set the intercom/program audio system to RTS or to two-wire system or to four-wire system.
Normally set to "4W".

• S6 (TLY)
This switch is used to set the interface system of the R tally and G tally.

Remark of signal	Setting position of S6
TALLY : ON The TALLY (X) and TALLY (Y) shorts. TALLY : OFF The TALLY (X) and TALLY (Y) opens.	CONTACT
TALLY : ON The potential difference between the TALLY (X) and the TALLY (Y) is DC12V to 24V TALLY : OFF The potential difference between the TALLY (X) and the TALLY (Y) is 0V or shorts.	POWER

Normally set to POWER



AU-98 BOARD (Component Side)

(6) IF-177 Board

• S1 (MODE SET)
This switch is unused.

• S2 (MODE)
By using the AUTO SETUP switch on the camera, the items marked with "○" in the following table can be adjusted automatically. Select the desired auto setup mode. For automatic adjustments, use the diascope built in the lens or the optional BKP-3615 auto setup chart.
Normally set to "0".

• S3
Normally set to "OFF".

• S8 (SHUTTER SPEED)
This switch is used to select the shutter speed of the CCD camera.

• S4

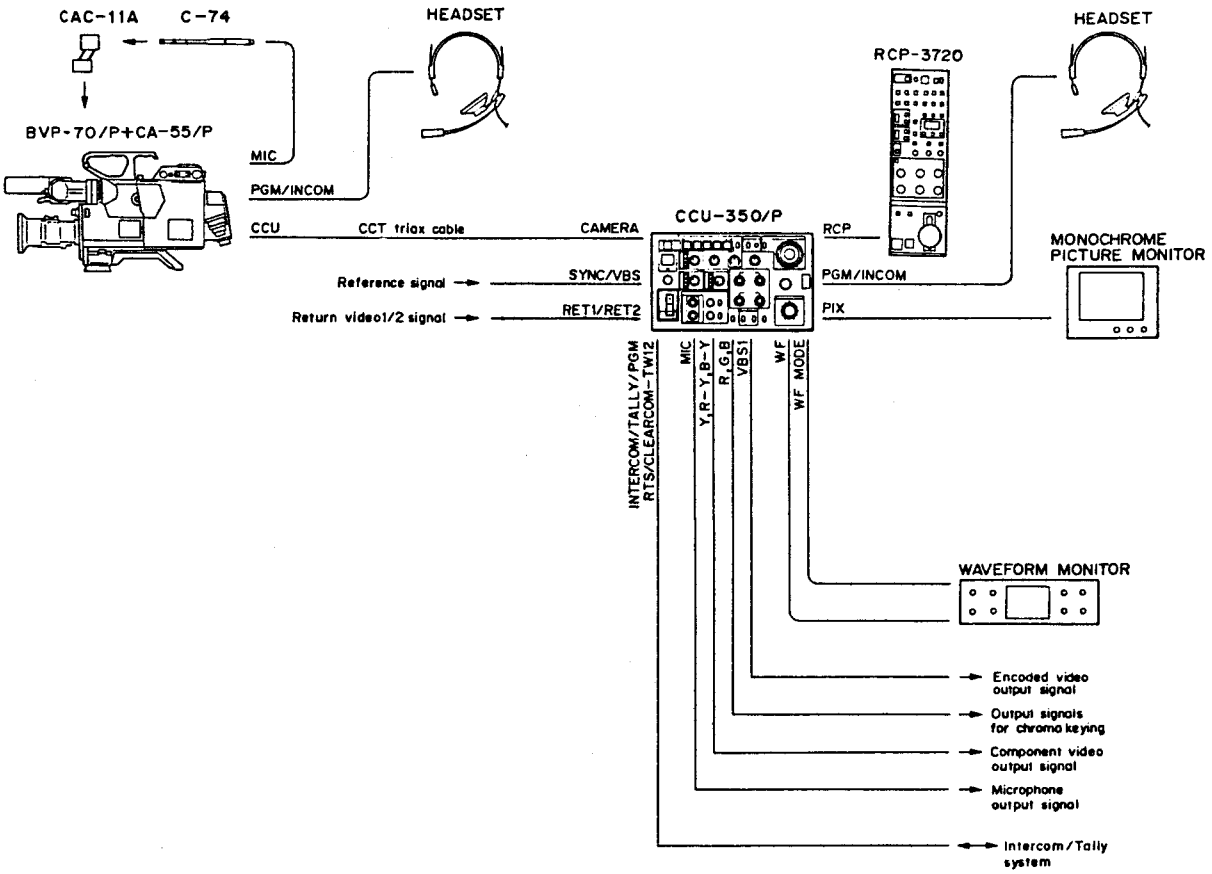
– 1 (FLARE) When turned on the switch, correct the flare by using the R/B BLACK control.
When turned off the switch, set the black level by using the R/B BLACK control.
Normally set to "OFF".

– 2 (GAIN H) When turned on the switch, the gain can be set as follows.
Normally set to "OFF".

Setting position of S4 – 2	GAIN control			
	0	6	9	18
OFF	0	6	9	18
ON	0	3	6	9

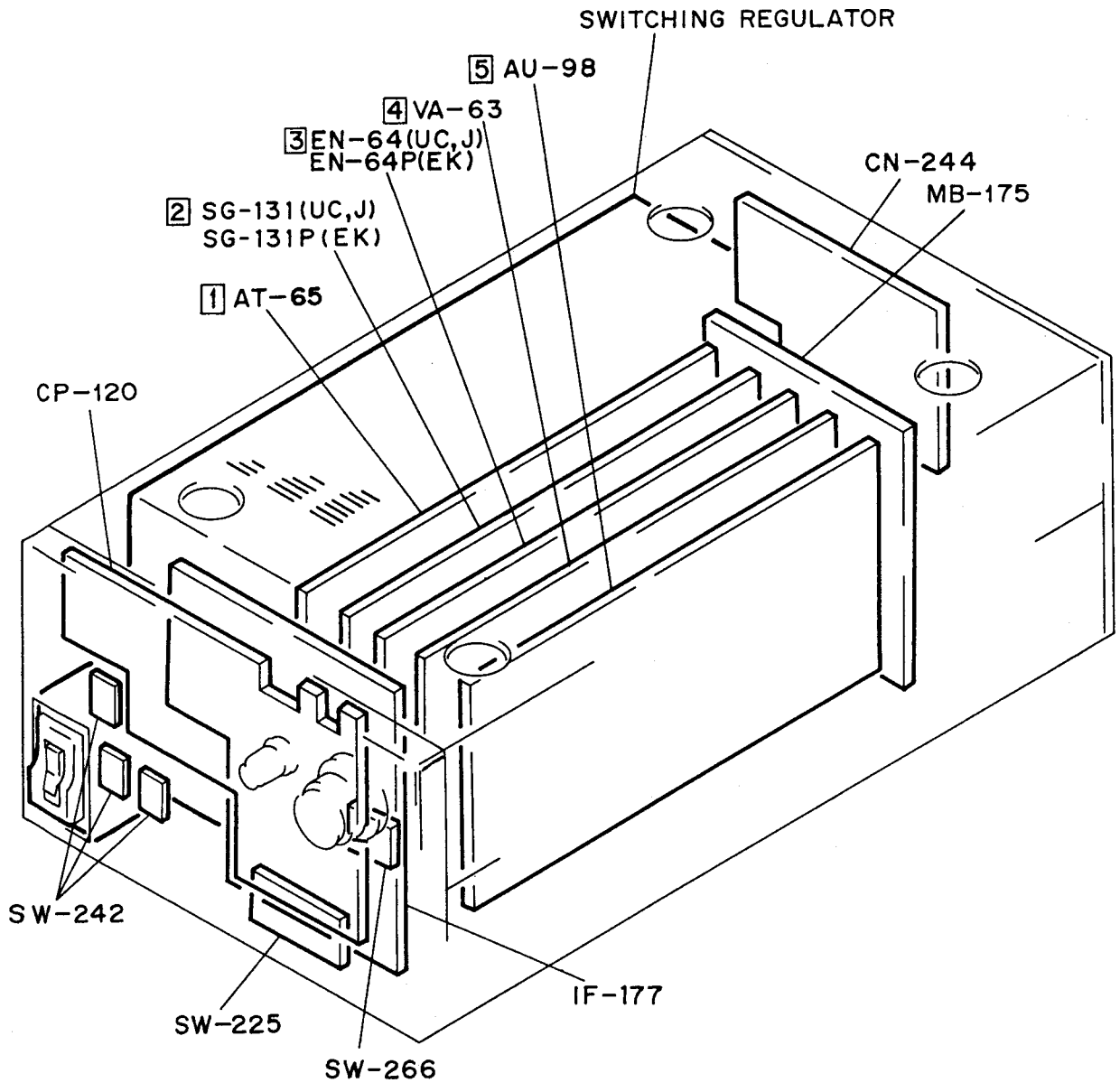
Adjustable items	Setting position of S2									
	INT chart (DIASCOPE)					EXT chart (BKP – 3615)				
	0 CENT	1 QUICK	2 FULL	3 REGI	4 COLOR	8 CENT	9 QUICK	A FULL	B REGI	C COLOR
White balance	–	○	○	–	○	–	○	○	–	○
Black balance	–	○	○	–	○	–	○	○	–	○
Gamma	–	○	○	–	○	–	○	○	–	○
Flare	–	○	○	–	○	–	○	○	–	○
Master black	–	○	○	–	○	–	○	○	–	○
Black set	–	○	○	–	○	–	○	○	–	○
V Modulation shading	–	○	○	–	○	–	○	○	–	○
H centering	○	○	○	○	–	○	○	○	○	–
V centering	○	○	○	○	–	○	○	○	○	–
H size	–	○	○	○	–	–	○	○	○	–
V size	–	○	○	○	–	–	○	○	○	–
H skew	–	○	○	○	–	–	○	○	○	–
V skew	–	○	○	○	–	–	○	○	○	–
Digital registration	–	–	○	○	–	–	–	○	○	–

2-8. SYSTEM EXPANSION



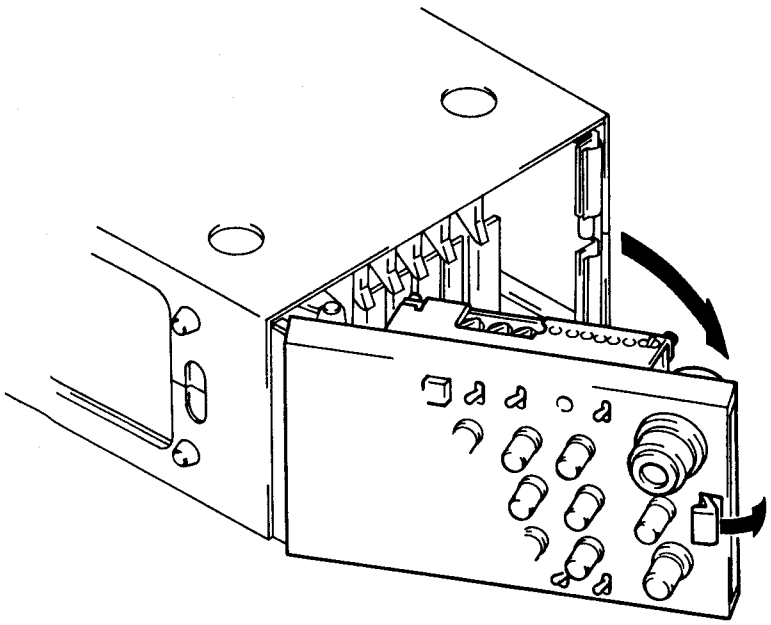
SECTION 3
SERVICE INFORMATION

3-1. BOARD LAYOUT



3-2. REPLACEMENT OF MAIN PARTS

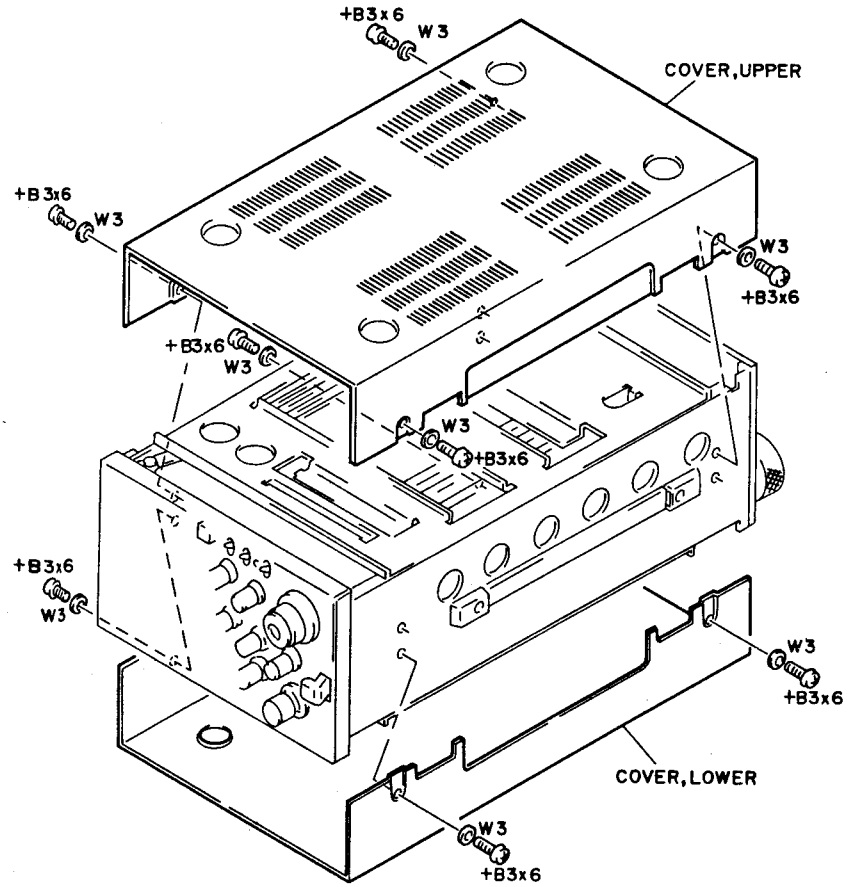
3-2-1. Front Panel Opening/Closing



Pull the lever, and open the front panel.

3-2-2. Cabinet Removal

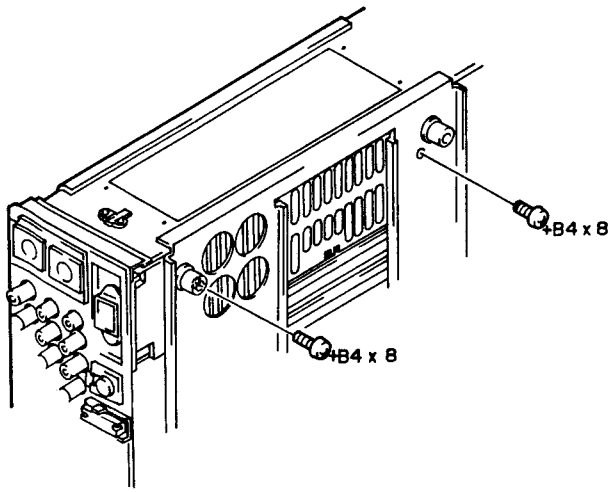
Remove the eight screws (+B3×6) and then remove UPPER COVER and LOWER COVER.



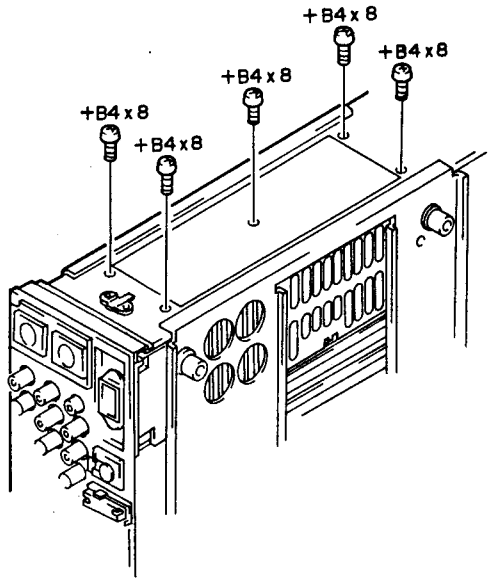
3-2-3. Replacement of Switching Regulator

1. Remove the cabinet refer to section 3-2-2.

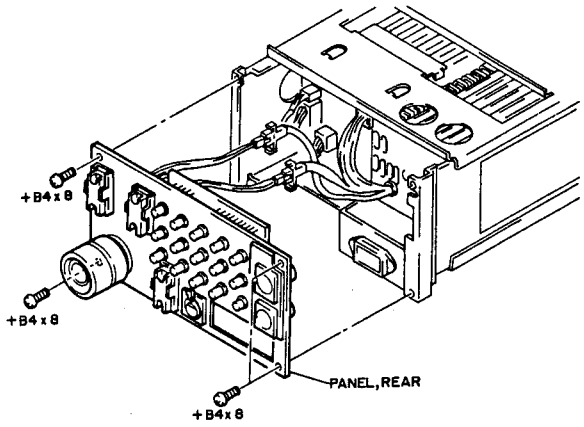
2. Remove the two +B4×8 screws fixing the shield case.



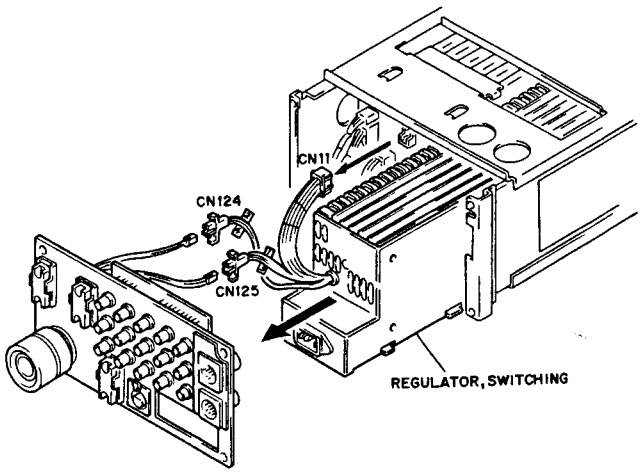
3. Remove the five +B4×8 screws fixing the shield case.



4. Remove the four +B4×8 screws fixing the rear panel.



5. Disconnect the harness and pull out the switching regulator.



3-3. SERVICING PRECAUTION

3-3-1. Power Supply Unit Precaution

(1) One switching regulator is used as power source of the CCU. Since this switching regulator is mainly on the primary side, it is important to beware of electric shock.

(2) Running the power supply unit under no load may cause power source trouble, so never check the power supply unit independently.

(3) If an abnormality occurs during operation, the power supply unit stops oscillating and does not refunction until the power switch is turned off, then to ON again. Wait 1 minute or longer before setting the POWER switch to on again.

(4) Various DC voltage (+24V, +20V, +9.5V, and −5.5V) are supplied from the Power Supply Unit to respective boards of the CCU-350. These DC voltage circuit effect each other. When a dc voltage circuit broke, the operation of the all dc voltage circuits stop. Therefore, when the dc voltages don't appear at the output terminal of the power supply unit, replace the power supply unit.

Power Supply Unit (Sony part No. 1-413-352-11)

3-3-2. Precaution on Replacement Parts

(1) Safety Related on Components Warning
Components identified by shading marked with ⚠ on the exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony Parts whose part numbers appear in this manual or in Service bulletins and service manual supplement published by Sony.

(2) Standardization of Parts
Repair parts supplied from Sony Parts Center may not be always identical with the part which actually in use due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts". This manual's exploded views and electrical spare parts list are indicating the parts number of "the standardization genuine parts at present".

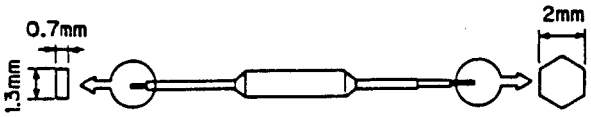
(3) Stocked of Parts
The parts marked with "S" in the SP column of the exploded views and electrical spare parts list are normally required for routine service work. Order for parts marked with "O" will be processed, but allow for additional delivery time.

(4) Units of Capacitors, Inductors, and Resistors
The following units are omitted in the schematic diagrams, exploded views, and electrical parts lists unless otherwise specified :

Capacitor	: μ F
Inductor	: μ H
Resistor	: Ω

3-4. TOOLS AND JIGS

• Adjusting screwdriver
Sony part No. 7-700-733-11



3-5. SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 3.5 mA. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 5.25V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 20V AC range are suitable. (See Fig. A)

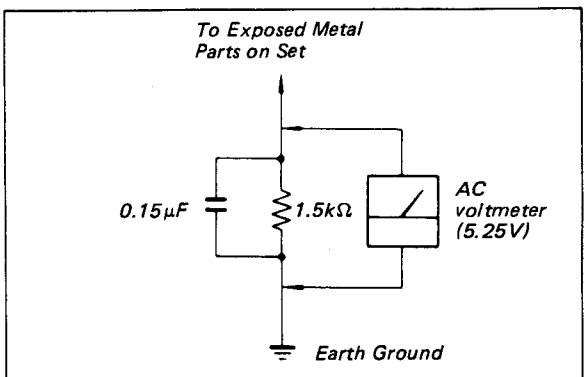


Fig. A. Using an AC voltmeter to check AC leakage.

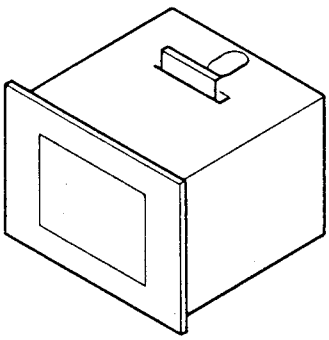
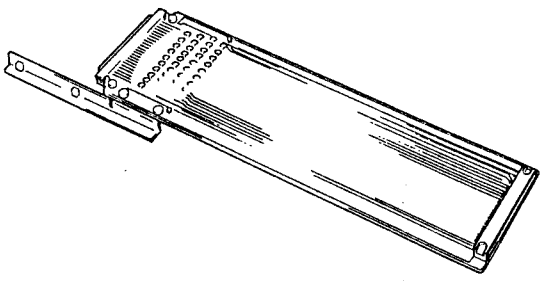
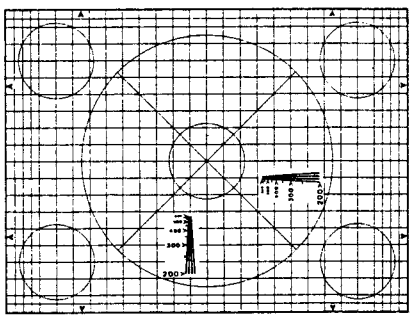
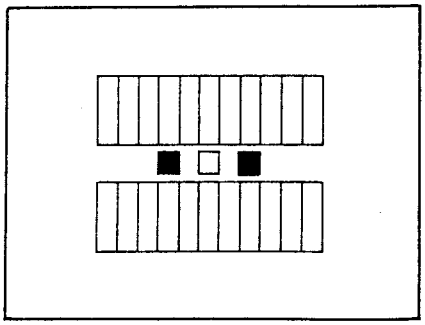
SECTION 4
ALIGNMENT

4-1. PREPARATION

4-1-1. Equipment Required

1. Oscilloscope
   Tektronix 2465 or equivalent
2. Waveform monitor
   Tektronix 1485R or equivalent
3. Color monitor
   Sony PVM-1311 or equivalent
4. NTSC vectorscope
   Tektronix 520A or equivalent
5. NTSC test signal generator
   Tektronix 1910A or equivalent
6. Digital voltmeter
7. Frequency counter
8. Low frequency oscillator
9. Variable DC power supply (5V,1A)

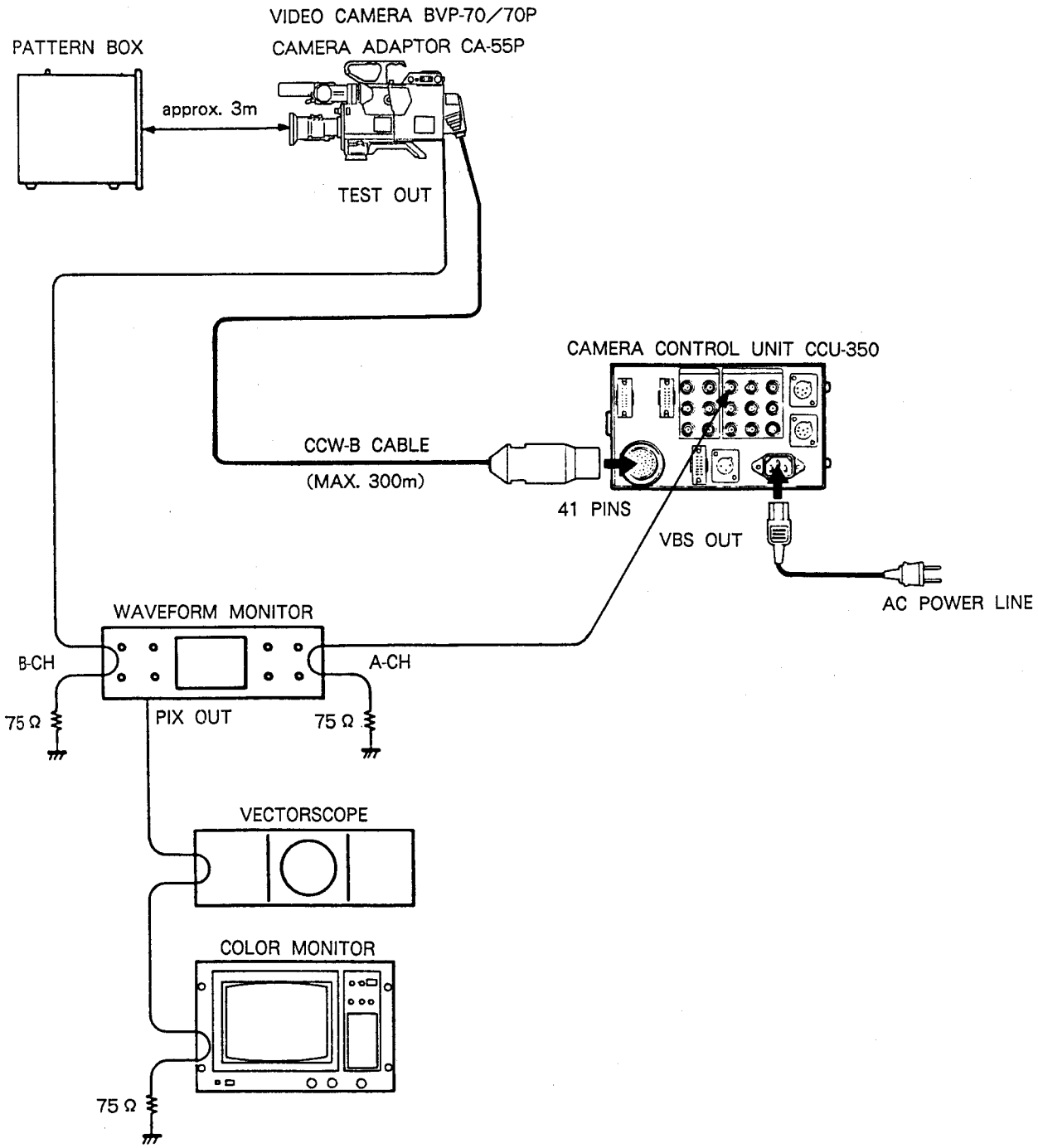
4-1-2. Jigs

J-6029-140-A	Pattern Box PTB-500	A-7513-613-A	Extension Board EX-152
			
J-6026-120-A	Registration Chart	J-6026-130-B	11-step Gray Scale Chart
			

4-1-3. Connection

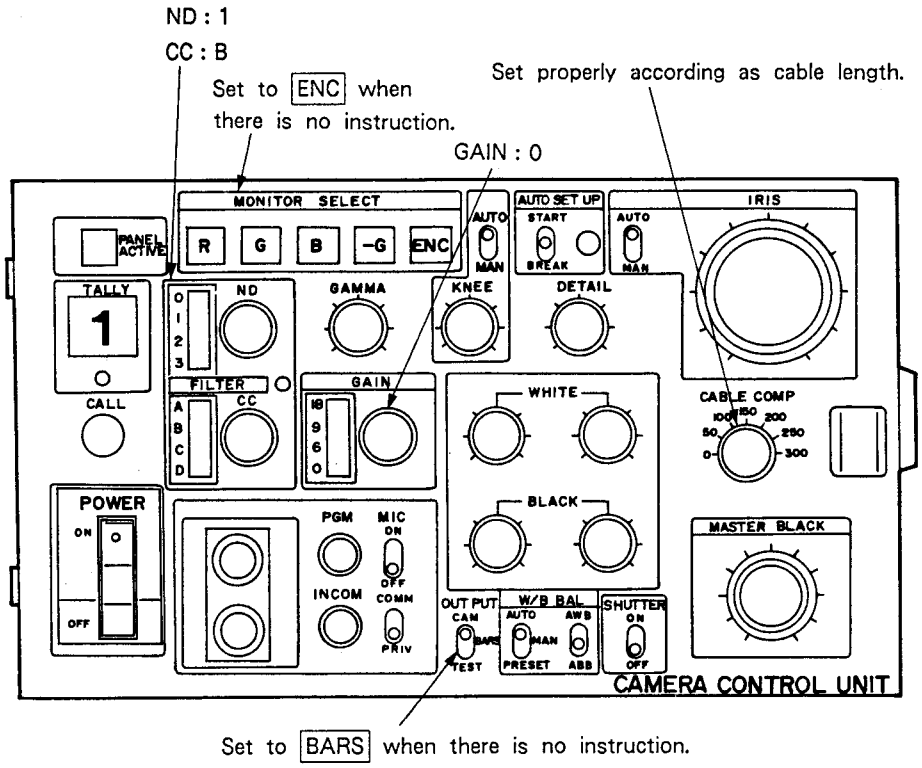
- Connect all equipment as shown in figure below.
- When setting the camera and test pattern, be sure to match the center of lens and pattern box so that the chart frame and underscan frame of monitor coincide. (approx. 3m)

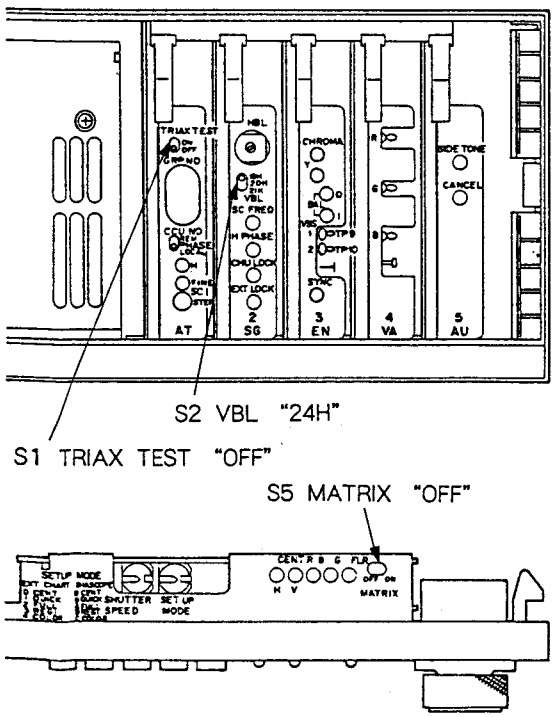
Note : Before adjustment, make sure to see that the alignment of camera is completed.



4-1-4. Initial Setting

1. Before adjustment, turn on the power and warm up for about 10 minutes.
2. Set the front panel and side panel as follows.





3. Set the switches on the respective board as follows.

AT-65 Board
- S2 (SYSTEM MODE) →370
- S7 (CONTROL) →PANEL

EN-64 Board
- S1 (I) →ON
- S2 (Q) →ON
- S3 (COLOR BARS) →EIA
- S4 (G/Y SYNC) →OFF
- S5 (VIDEO SYNC) →ON
- S6 (R/R − Y,B/B − Y,SYNC) →OFF

VA-63 Board
- S301 (RGB/YUV) →RGB

AU-98 Board
- S1 (MIC GAIN) →0dB

4-2. ALIGNMENT PROCEDURE

Step 1. Power Supply System Adjustment

1-1. REG + 22V Adjustment (AU-98 Board)
1-2. REG + 9V Adjustment (SG-131 Board)
1-3. REG + 9V Adjustment (VA-63 Board)
1-4. REG + 5V Adjustment (EN-64 Board)
1-5. REG + 5V Adjustment (AT-65 Board)

Step 2. Genlock Control System Adjustment (SG-131 Board)

2-1. Subcarrier Frequency Adjustment
2-2. SC Phase Adjustment
2-3. H Phase Adjustment
2-4. SYNC Phase Adjustment
2-5. Burst Adjustment
2-6. H BLKG Adjustment
2-7. CHU H Phase Adjustment
2-8. V Reset Adjustment

Step 3. Cable Compensator System Adjustment (VA-63 Board)

3-1. R/G/B Cable Compensation (0m) Adjustment
3-2. R/G/B Cable Compensation (50m to 300m) Adjustment
3-3. Return Video Level Adjustment

Step 4. Encoder System Adjustment (EN-64 Board)

4-1. Carrier Balance Adjustment
4-2. R/G/B Output Level Adjustment
4-3. Color Bar Level Adjustment
4-4. BETACAM Output Level Adjustment
4-5. VBS Y Level Adjustment
4-6. VBS SYNC Level Adjustment
4-7. Color Bar Adjustment
4-8. VBS/VB Level Adjustment
4-9. WF Output Level Adjustment
4-10. DC Offset Adjustment
4-11. STAIR CASE Adjustment
4-12. PIX Output Adjustment
4-13. PIX SYNC Phase Adjustment

Step 5. Control System Adjustment (IF-177 Board)

5-1. Iris Control Setting
5-2. R/B Gamma Adjustment
5-3. G Flare Adjustment
5-4. R/B Registration (H/V CENT) Adjustment

Step 6. Intercom System (AU-98 Board)

6-1. Mic Level Adjustment
6-2. Side Tone/Cancel Adjustment

STEP 1. POWER SUPPLY SYSTEM ADJUSTMENT

Note :

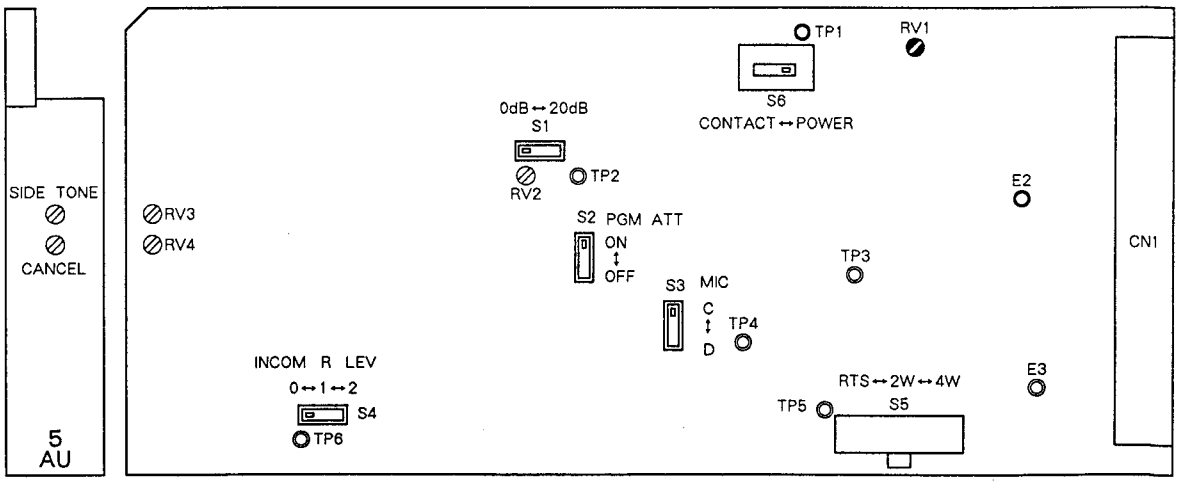
- Before performing the adjustment of step 2 and later, measure the voltage at respective board. If measured voltage is within ±1% as against the rated voltage, adjustment is unnecessary.
  If voltage does not satisfy the rated voltage, or voltage does not output, replace the power supply unit.
  Power Supply Unit (Sony Part No. 1-413-352-11)
- When adjustment of step 1 is performed, all of the following steps must be performed.
- When performing the adjustment, be sure to connect the color camera BVP-350 in order to obtain proper loading condition.

Equipment : Digital voltmeter

1-1. REG +22V Adjustment (AU-98 Board)

To be extended : AU-98
Test point : TP1 (GND=E2) /AU-98

Adj. point : ◐RV1 (+22V ADJ) /AU-98
Specification : +22V±0.01Vdc

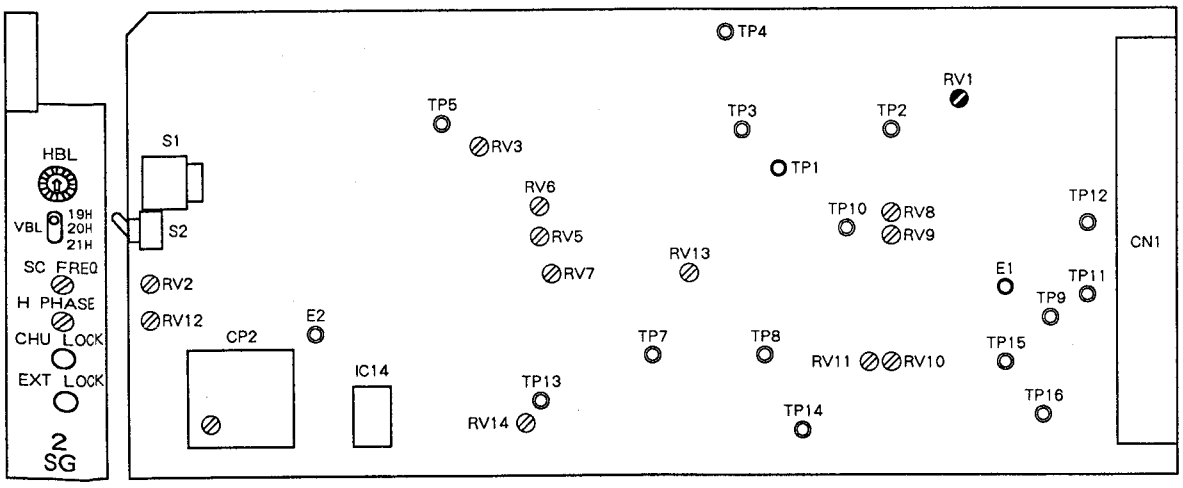


AU-98 BOARD (Component Side)

1-2. REG +5V Adjustment (SG-131 Board)

To be extended : SG-131
Test Point : TP1 (GND=E1)

Adj. point : ◉RV1 (+5V ADJ) /SG-131
Specification : +5V±0.01Vdc

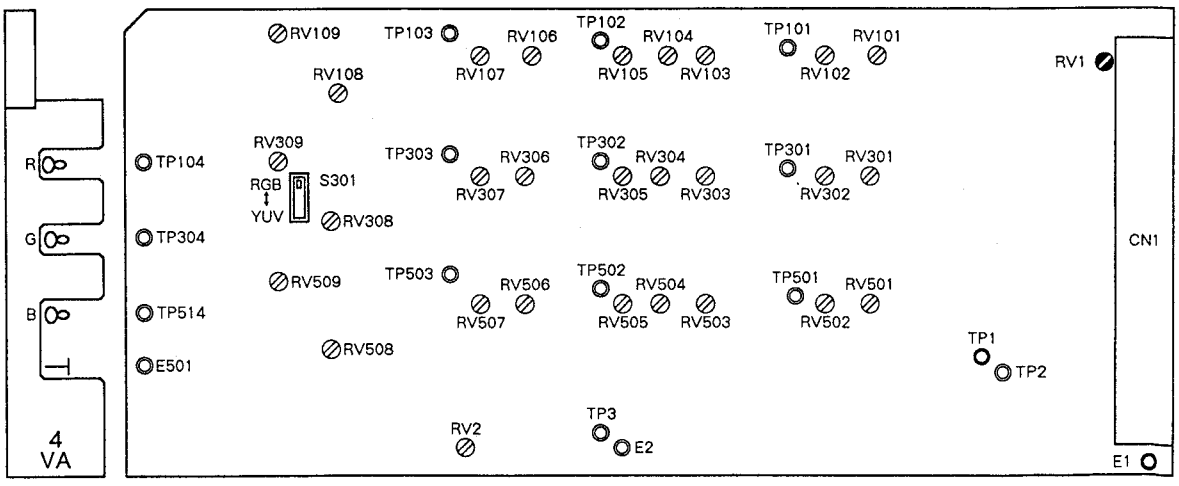


SG-131 BOARD (Component Side)

1-3. REG +9V Adjustment (VA-63 Board)

To be extended : VA-63
Test point : TP1 (GND=E1)

Adj. point : ●RV1 (+9V ADJ) /VA-63
Specification : +9V±0.01Vdc

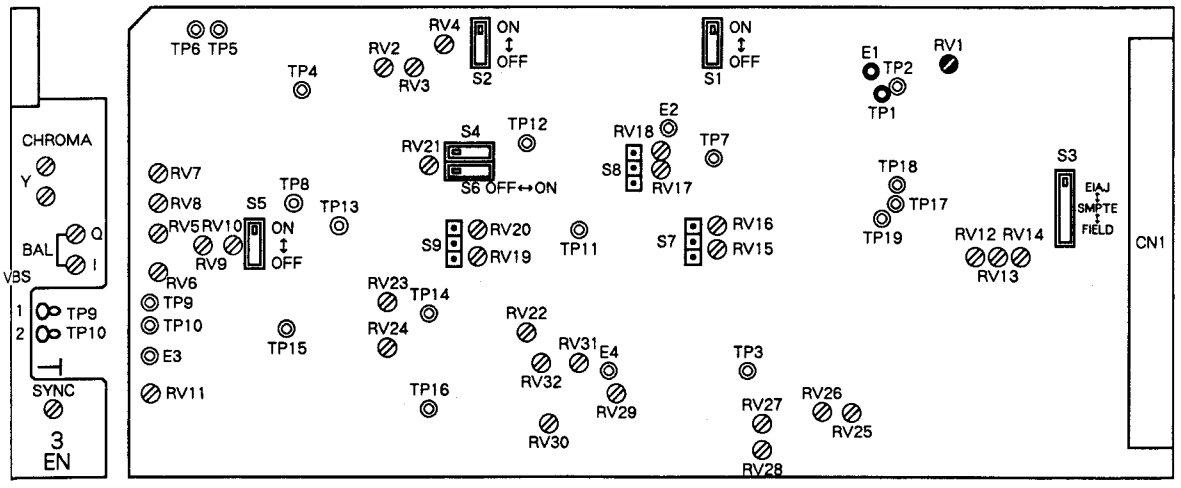


VA-63 BOARD (Component Side)

1-4. REG +5V Adjustment (EN-64 Board)

To be extended: EN-64
Test point: TP1 (GND = E1)

Adj. point: ◐RV1 (+ 5V ADJ) /EN-64
Specification: + 5V ± 0.01Vdc



EN-64/64P BOARD (Component Side)

1-5. REG +5V Adjustment (AT-65 Board)

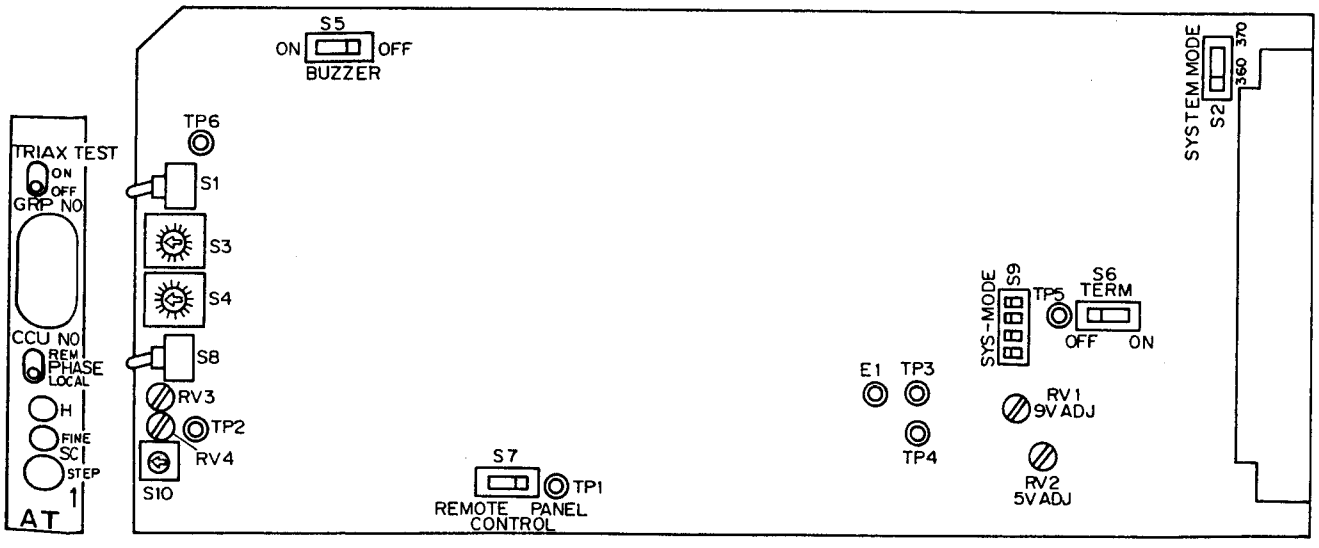
To be extended: AT-65
Test point: TP1 (GND = E1)

Adj. point: ◐RV2 (+ 5V ADJ) /AT-65
Specification: + 5V ± 0.01Vdc

1-6. REG +9V Adjustment

To be extended: AT-65
Test point: TP3 (GND = E1)

Adj. point: ◐RV1
Specification: + 9V ± 0.1Vdc



AT-65 BOARD (Component Side)

STEP 2. GENLOCK CONTROL SYSTEM ADJUSTMENT (SG-131 Board)

2-1. Subcarrier Frequency Adjustment

Note

- Be sure to check that the unit is not in the GENLOCK mode.

To be extended : SG-131
Equipment : Frequency counter
Digital voltmeter
Test point : TP5 (GND=E1) /SG-131

Adj. point :

- ◐ RV2 (SC FREQ) /SG-131
- CP2/SG-131

Procedure :

1. Adjust ◐RV2 so that the voltage at TP5 is 2.5±0.1V.
2. Adjust ◐CP2 so that the frequency at pin 10 or pin 14 of IC14 is 3.579545MHz±2Hz.

2-2. SC Phase Adjustment

Preparation

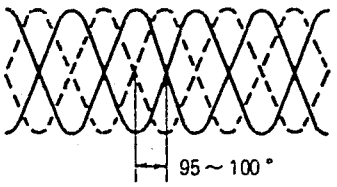
- ◐RV11 (SC PHASE) /SG-131→mechanical center
- OUTPUT switch/front panel→BARS
- S8 (PHASE) /AT-65→LOCAL

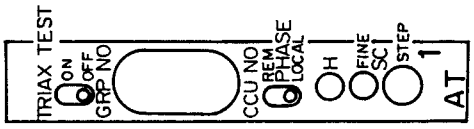
To be extended: SG-131
Equipment: Oscilloscope
Test point: TP15/SG-131

Adj. point: ◐RV10 (SC RANGE) /SG-131

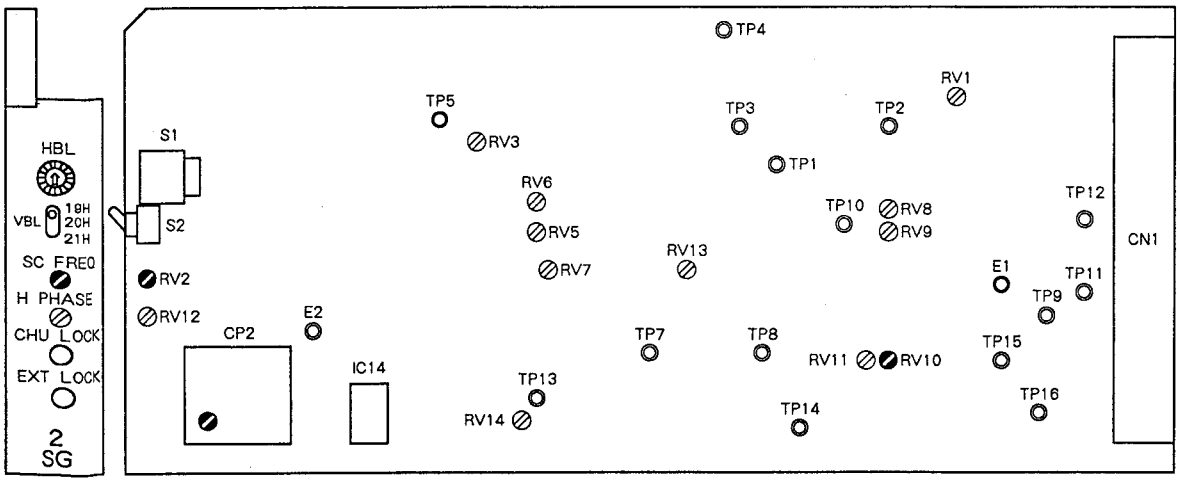
Procedure:

- Adjust ◐ RV10 (SC RANGE) so that the subcarrier phase can be shifted 95° to 100° when ◐RV4 SC PHASE on the AT-65 board is turned.





AT-65 (Side Panel)



SG-131 BOARD (Component Side)

2-3. H Phase Adjustment

Preparation

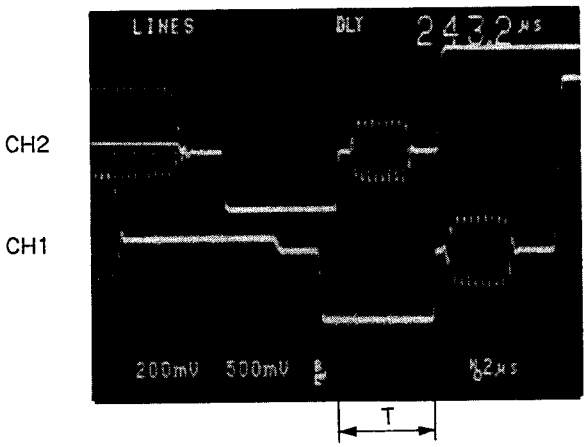
- Supply VBS or BLACK BURST signal to the GENLOCK IN terminal at the rear panel of CCU. It is to be desired that other GENLOCK IN terminal will be terminated with 75 Ω.
- ⊘RV3 [H PHASE]/AT-65→fully counterclockwise○

To be extended: SG-131
Equipment: Oscilloscope
Test point: CH1 = TP7/extension board
CH2 = TP9/EN-64
Trigger: CH1

Adj. point:
- ⊘RV12 (H PHASE) /SG-131
- ⊘RV3 (H CONT RANGE) /SG-131

Specification: T = 4.0 ± 0.1 μ S

Procedure:
1. Set ⊘RV3 [H PHASE] on the AT-65 board fully counterclockwise and adjust ⊘RV12 and ⊘RV3 (SG) alternately until T becomes 3 μ s.
2. Set ⊘RV3 [H PHASE] fully clockwise and adjust ⊘RV12 and ⊘RV3 (SG) alternately until T becomes − 1.5 μ s.
3. After the adjustment, CH2 synchronizing phase equal in CH1 phase with ⊘RV3 (AT).



2-4. SYNC Phase Adjustment

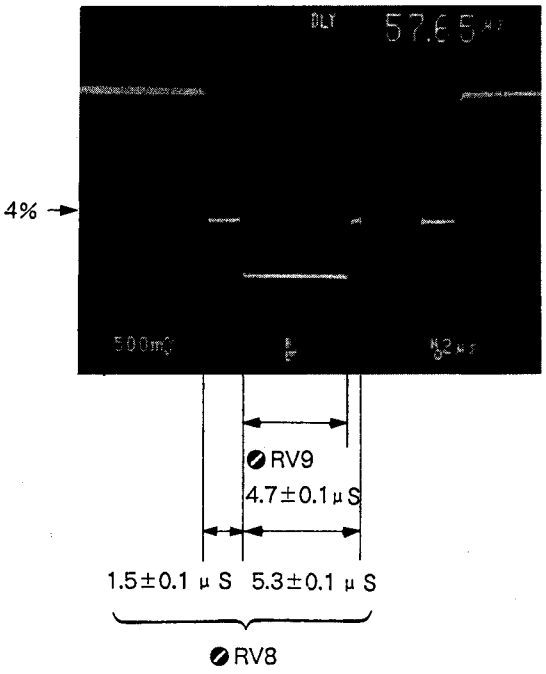
Preparation

- [OUTPUT] switch/front panel→[CAM]
- Adjust the zoom control so that the pattern box frame touches the underscanned picture frame on the monitor.

To be extended: SG-131
Equipment: Oscilloscope
Test point: TP10 (VBS OUT) /EN-64

Adj. point:
- ⊘RV8 (SYNC PHASE) /SG-131
- ⊘RV9 (SYNC WIDTH) /SG-131

Specification:



2-5. Burst Adjustment

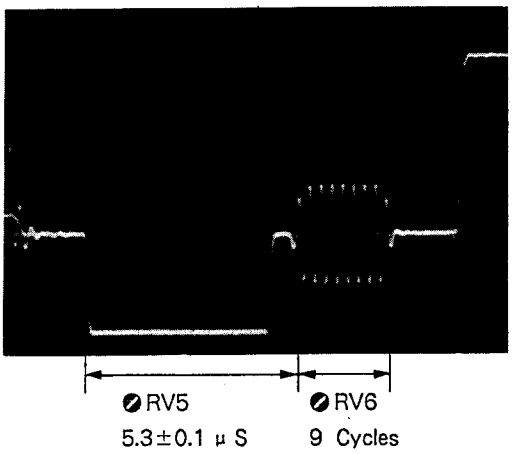
Preparation

- Supply VBS or BLACK BURST signal to the GENLOCK IN terminal at the rear panel of CCU. It is to be desired that other GENLOCK IN terminal will be terminated 75 Ω.
- OUTPUT switch/front panel→BARS

To be extended : SG-131
Equipment : Waveform monitor
Test point : VBS OUT/Rear Panel

Adj. point :
- ◐RV5 (BURST START) /SG-131
- ◐RV6 (BURST STOP) /SG-131

Specification :



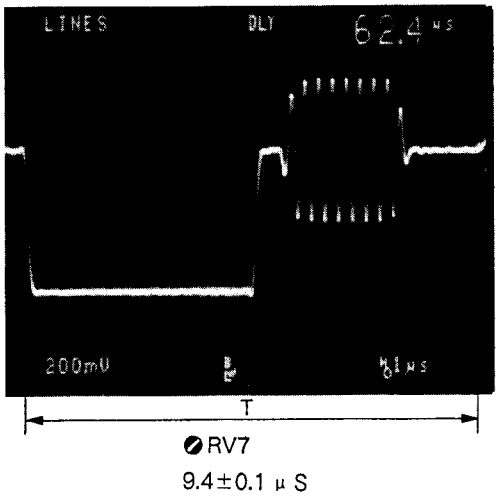
2-6. H BLKG Adjustment

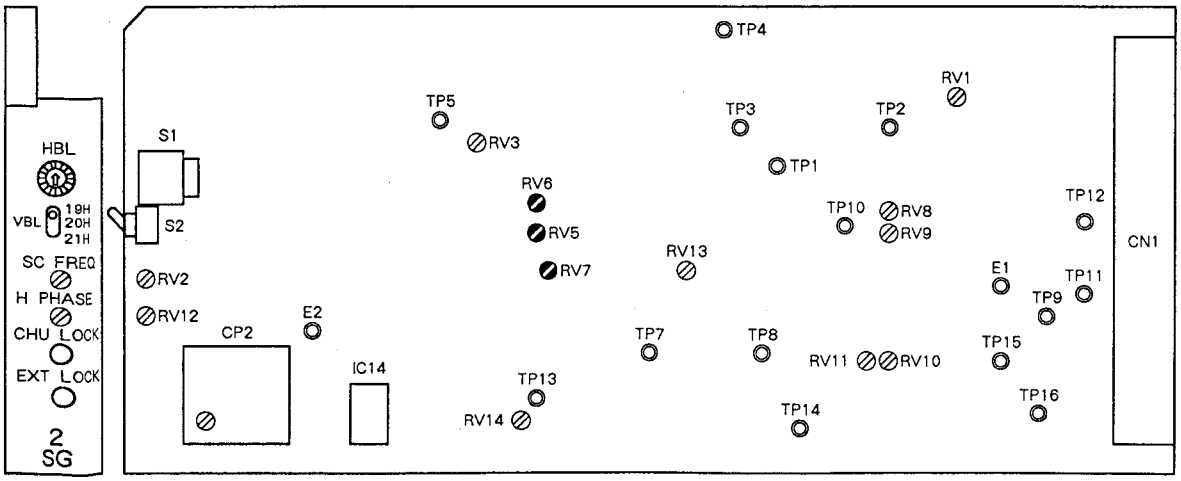
Preparation

- OUTPUT switch/front panel→BARS

To be extended : SG-131
Equipment : Oscilloscope
Test point : TP10 (VBS OUT) /EN-64

Adj. point : ◐RV7 (BLK WIDTH) /SG-131
Specification : T=9.4±0.1 μ S





SG-131 BOARD (Component Side)

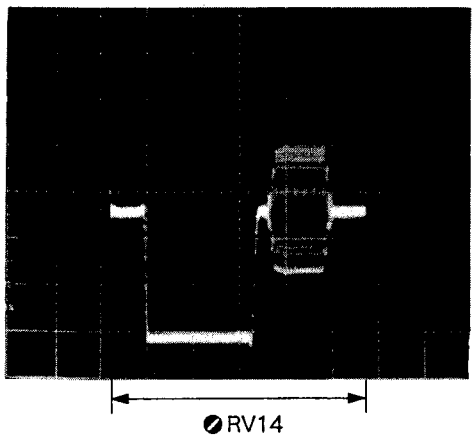
2-7. CHU H Phase Adjustment

Preparation

- OUTPUT switch/front panel→CAM
- Adjust the zoom control so that the pattern box frame touches the underscanned picture frame on the monitor.

To be extended : SG-131
Equipment : Oscilloscope
Test point : TP10 (VBS OUT) /EN-64

Adj. point : ◐RV14 (CHU H PHASE) /SG-131
Specification : Adjust ◐RV14 until the camera blanking does not appear at active scanning time.



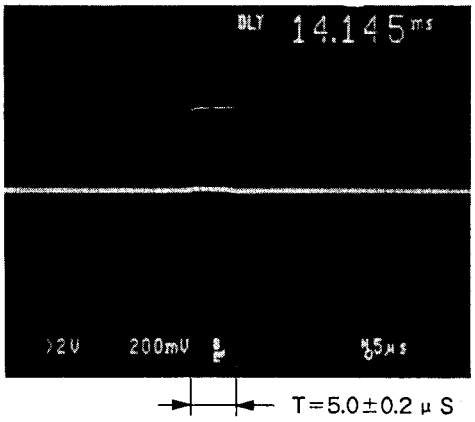
2-8. V Reset Adjustment

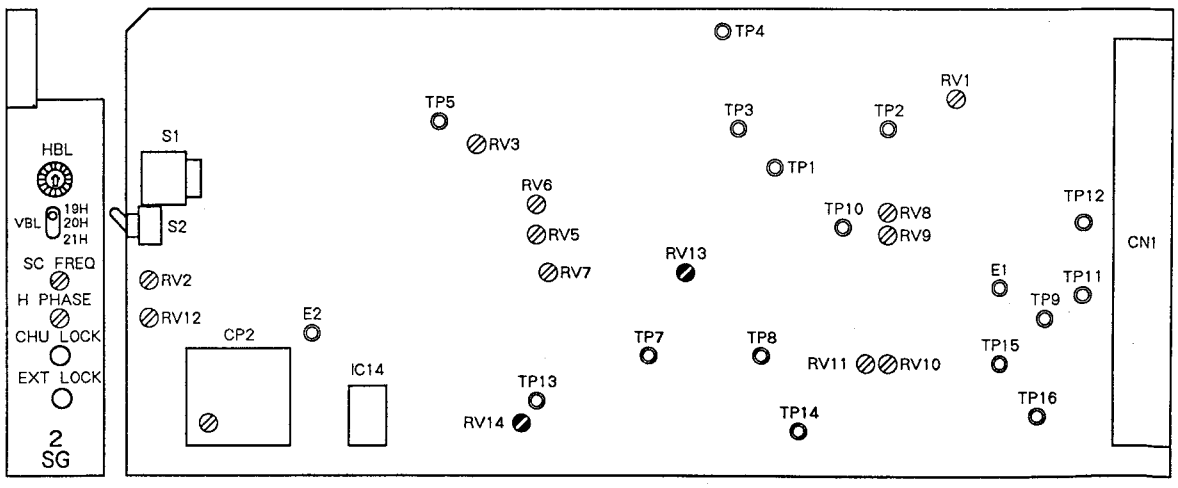
Preparation

- OUTPUT switch/front panel→CAM

To be extended : SG-131
Equipment : Oscilloscope
Test point : TP30/extension board
Trigger : TP32 (VD) /extension board

Adj. point : ◐RV13 (V RESET ADJ) /SG-131
Specification : T=5.0±0.2 μS





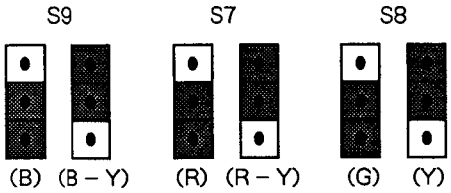
SG-131 BOARD (Component Side)

STEP 3. CABLE COMPENSATOR SYSTEM ADJUSTMENT(VA-63 Board)

3-1. R/G/B cable Compensator(0m) Adjustment

Note

- This adjustment should be performed only when potentiometer is replaced to new one.
- Be sure to use the CCW cable of 2m in length.
- Output signal can be selected by the setting of jumper switches S7, S8, and S9 on the EN-64 board as follows.
  Confirm that the R/G/B signals are selected.



Preparation

- OUTPUT switch/front panel→CAM
- CABLE COMP selector/Front panel→0m
- ENC/REGI switch/BVP-350 side→REGI
- R/G/B switch/BVP-350 side→R
- – G/OFF switch/BVP-350 side→OFF

To be extended: VA-63
Equipment: Waveform monitor

Adj. point:

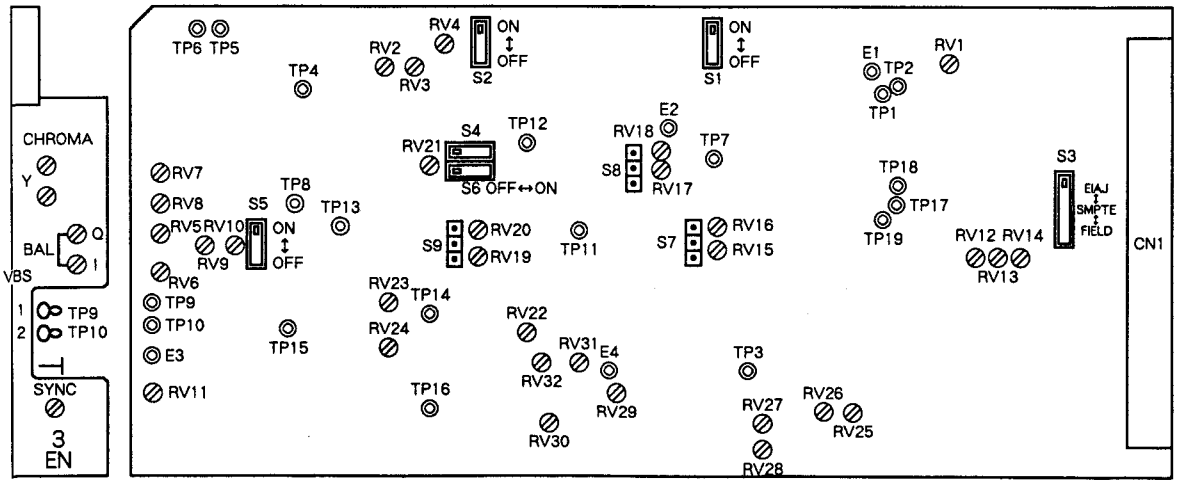
	Adj. point (VA-63)	
	0m COMP	CLAMP LEVEL
R	RV105	RV109
G	RV305	RV309
B	RV505	RV509

Procedure:

1. Connect channel A of waveform monitor to the output connector of R, G, and B in sequence, and set the R/G/B switch at the side of BVP-350.

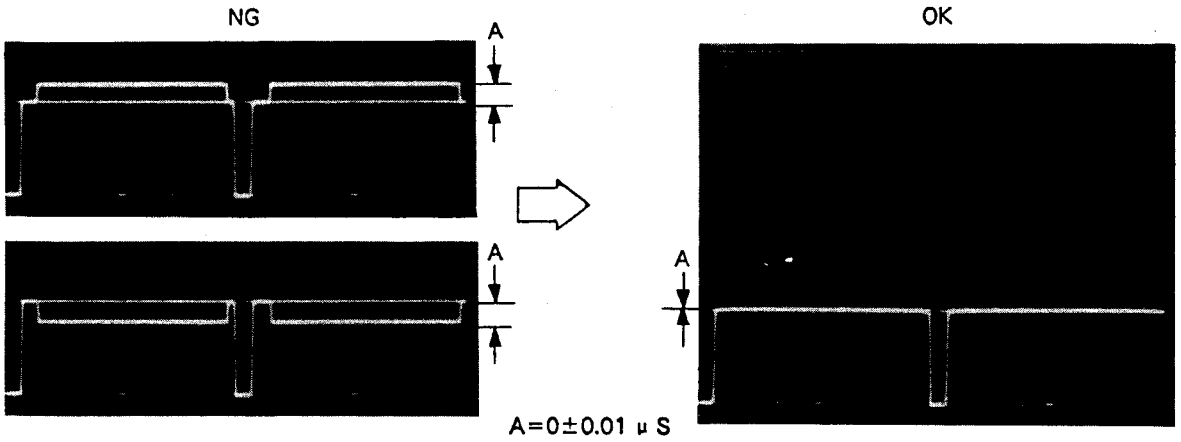
	R/G/B switch /BVP – 350	Output connector /CCU-350 rear panel
R	R	R/R – Y OUT
G	G	G/Y OUT
B	B	B/B – Y OUT

2. Set the lens iris to "C (Close)" position and adjusts the pedestal portion of the video signal to 0V.

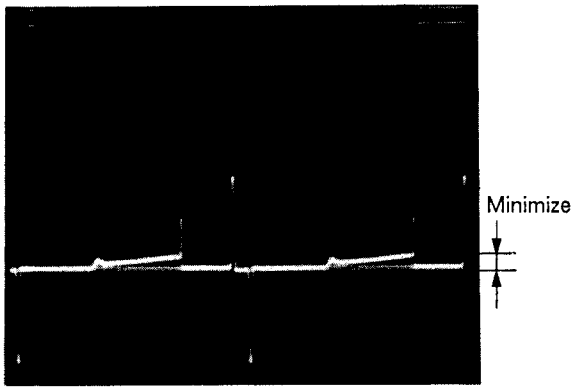


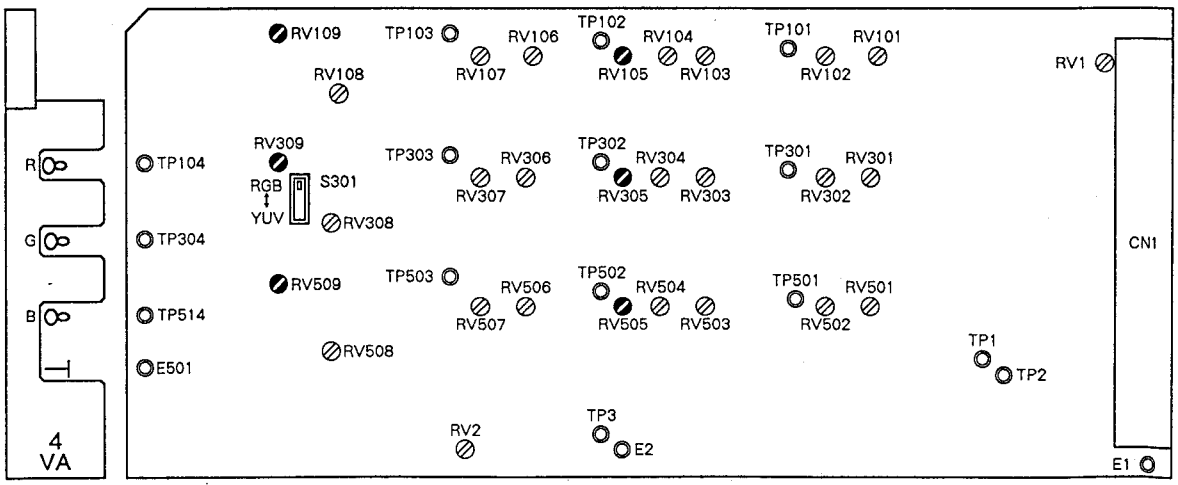
EN-64/64P BOARD (Component Side)

3. Set the waveform monitor to A mode and adjust clamp level A to 0±0.01V by ◐CLAMP LEVEL control.



4. [OUTPUT] switch/front panel→[TEST]
5. Set the waveform monitor to A-B mode and adjust ◐0m COMP control to minimum amplitude.





VA-63 BOARD (Component Side)

3-2. R/G/B Cable Compensator (50 to 300m) Adjustment

Note

- This adjustment should be performed only when potentiometer is replaced to new one.

Preparation

- OUTPUT switch/front panel → TEST
- ENC/REGI switch/BVP-350 side panel → REGI
- R/G/B switch/BVP-350 side panel → R
- −G/OFF switch/BVP-350 side panel → OFF

To be extended : VA-63
Equipment : Waveform monitor

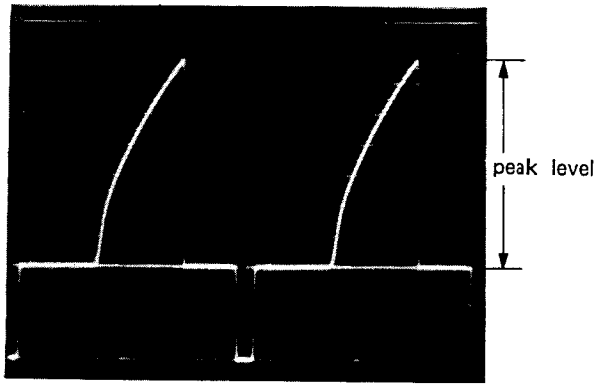
Adj. point :

Note : The following table shows the relationship between cable length and controls. Following adjustment procedure is a example when the 150m in cable length is connected between the CCU and the BVP-350.
Therefore, when using the cable other than 150m, set the CABLE COMP selector desired position and perform the same adjustment as following procedure.

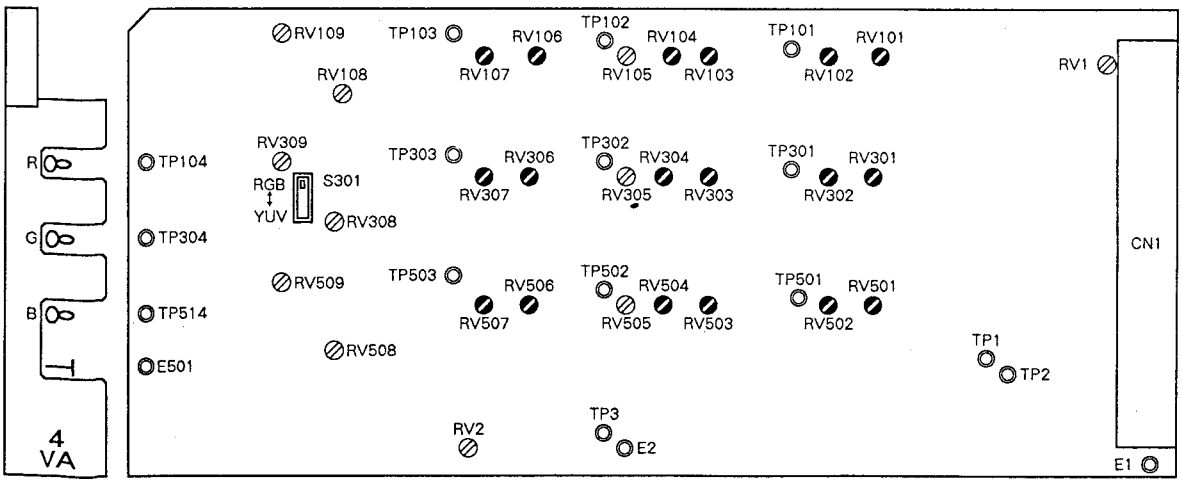
	Adj. point (VA-63)					
	50m	100m	150m	200m	250m	300m
R	RV101	RV102	RV103	RV104	RV106	RV107
G	RV301	RV302	RV303	RV304	RV306	RV307
B	RV501	RV502	RV503	RV504	RV506	RV507

Procedure :

1. Connect the output cable to the R/R−Y connector at the rear panel.
2. Set the waveform monitor to mode B.
3. Adjust RV103 so that the TEST SAW peak level in mode A and mode B are equal.



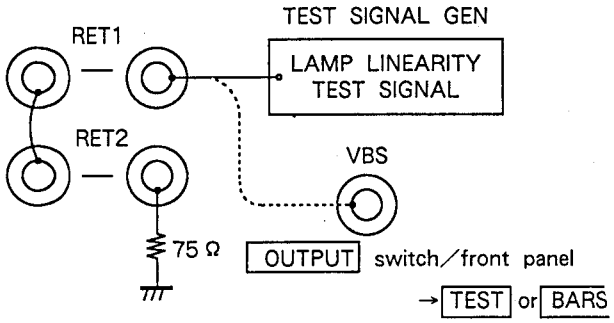
4. Set the R/G/B switch on the BVP-350 to G position.
5. Connect the output cable to the G/Y connector at the rear panel.
6. Adjust RV303 so that the TEST SAW peak level in mode A and mode B are equal.
7. Set the R/G/B switch on the BVP-350 to B position.
8. Connect the output cable to the B/B-Y connector at the rear panel.
9. Adjust RV503 so that the TEST SAW peak level in mode A and mode B are equal.



VA-63 BOARD (Component Side)

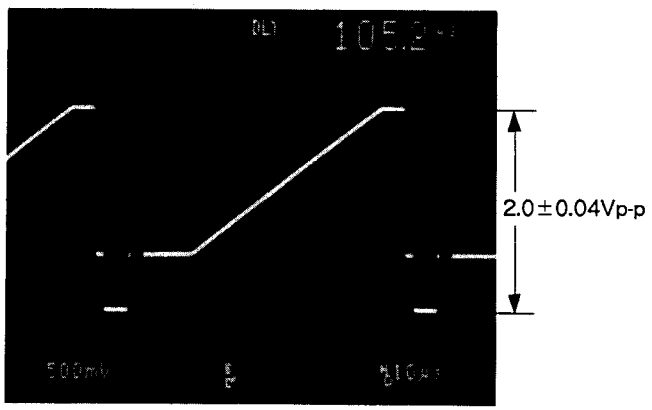
3-3. Return Video Level Adjustment

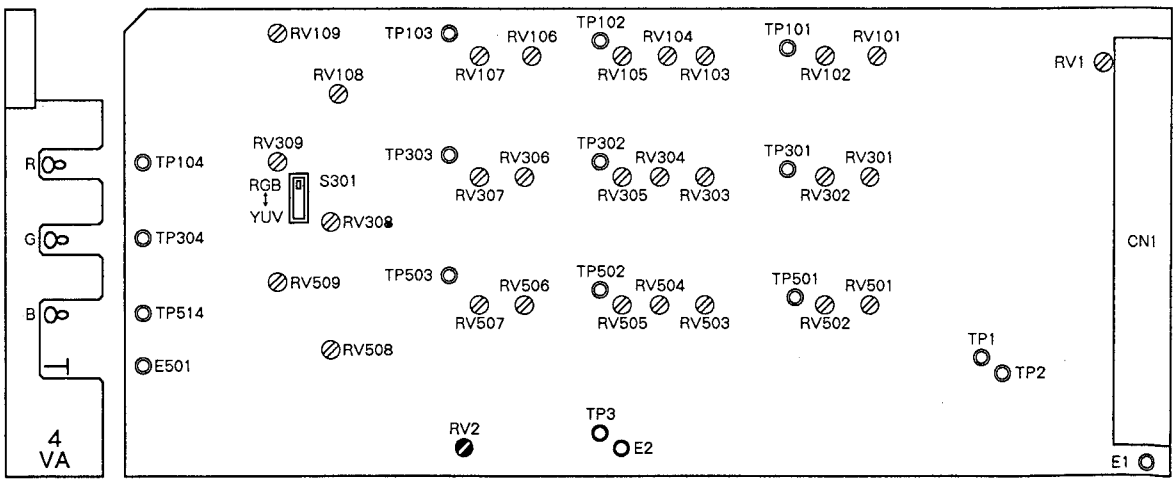
Connection/Equipment



To be extended : VA-63
Test point : TP3 (GND=E2) /VA-63

Adj. point : ◐RV2 (RET LEVEL) /VA-63
Specification : 2.0±0.04Vp-p





VA-63 BOARD (Component Side)

STEP 4. ENCODER SYSTEM ADJUSTMENT (EN-64 Board)

4-1. Carrier Balance Adjustment

Preparation

• [OUTPUT] switch/front panel → [BARS]

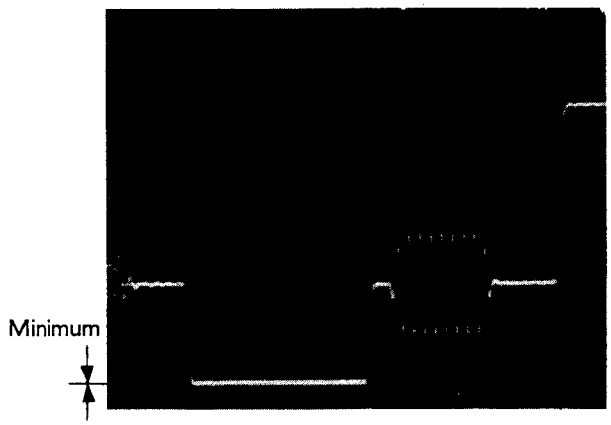
To be extended : EN-64
Equipment : Waveform monitor
Test point : Waveform monitor

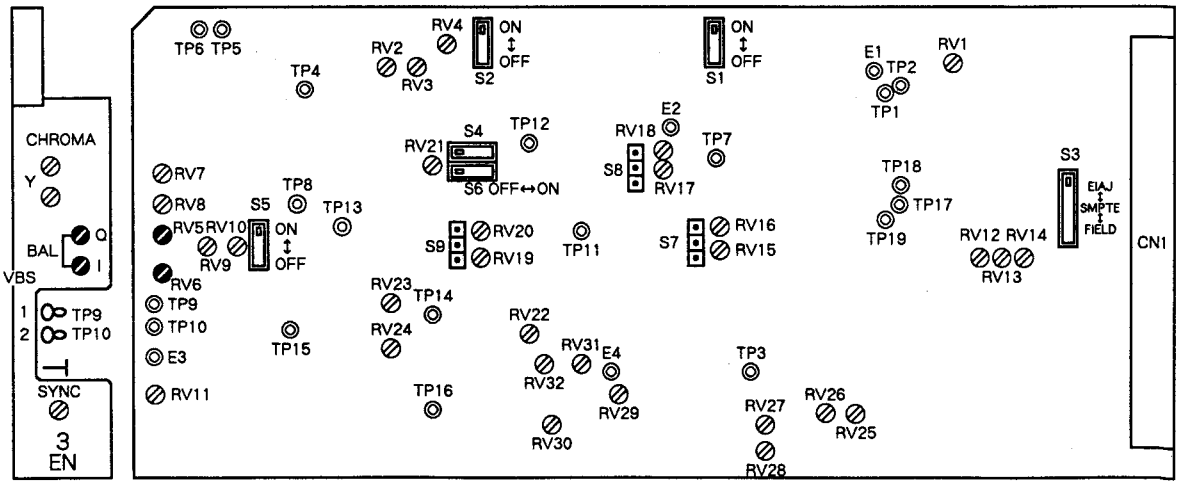
Adj. point :

• ⊘RV6 (I/V CARRIER BAL) /EN-64
• ⊘RV5 (Q/U CARRIER BAL) /EN-64

Procedure :

• Adjust ⊘RV6 and ⊘RV5 so that the carrier leak at the sync signal portion on the waveform monitor minimize.



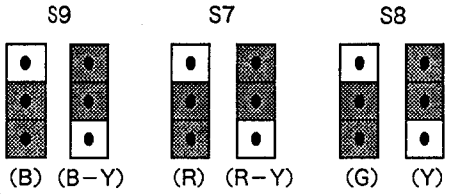


EN-64/64P BOARD (Component Side)

4-2. R/G/B Output Level Adjustment

Note

- When the output connector at the rear panel of the CCU is not terminated with 75 Ω terminator, measured value becomes double amplitude.
- Output signal can be selected by the setting of jumper switches S7, S8, and S9 as follows. In this adjustment, select R, G and B positions.



Preparation

- OUTPUT switch/front panel → TEST

To be extended : EN-64
Equipment : Oscilloscope

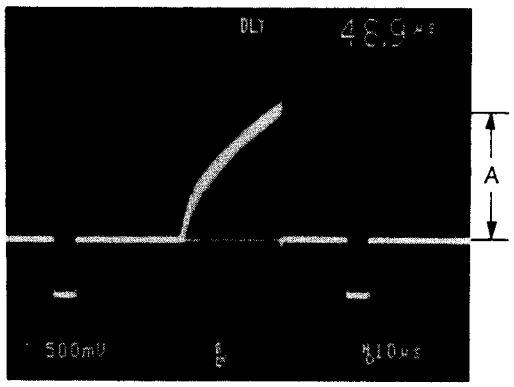
[B Output Level Adjustment]

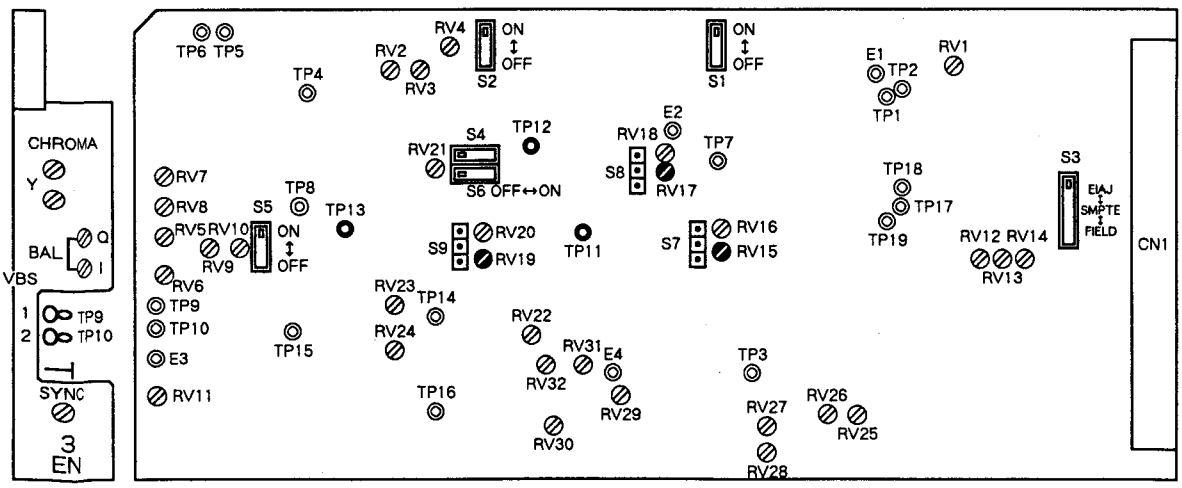
Test point : TP13/EN-64

Adj. point : ◐RV19 (B LEVEL) /EN-64

Procedure :

1. Connect between the channel A of the waveform monitor and B/B−Y connector at the rear panel.
2. Adjust ◐ RV19 so that the level A is 1400±20mV.





EN-64/64P BOARD (Component Side)

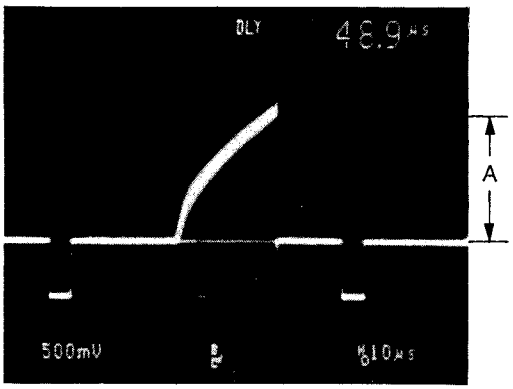
[R Output Level Adjustment]

Test point : TP11/EN-64

Adj. point : ⊘RV15 (R LEVEL) /EN-64

Procedure :

1. Connect between the channel A of the waveform monitor and R/R−Y connector at the rear panel.
2. Adjust ⊘ RV15 so that the level A is 1400±20mV.



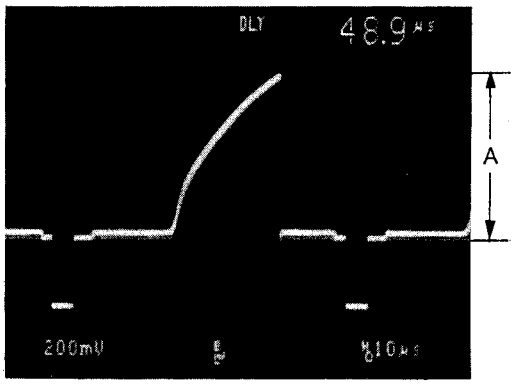
[G Output Level Adjustment]

Test point : TP12/EN-64

Adj. point : ⊘RV17 (G LEVEL) /EN-64

Procedure :

1. Connect between the channel A of the waveform monitor and G/Y connector at the rear panel.
2. Adjust ⊘ RV17 so that the level A is 1400±20mV.



4-3. Color Bar Level Adjustment

Preparation

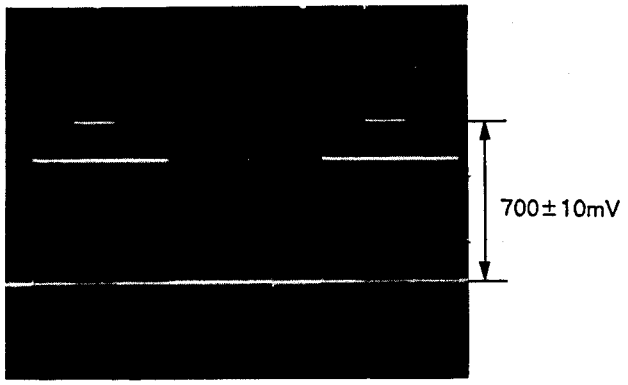
• OUTPUT switch/front panel → BARS

To be extended : EN-64
Equipment : Oscilloscope
Waveform monitor
Test point : TP17 (R LEVEL)
TP18 (G LEVEL)
TP19 (B LEVEL)

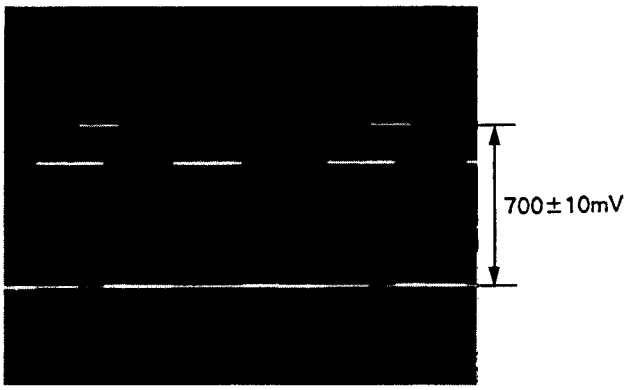
Adj. point :
- ⊘RV12 (R LEVEL) /EN-64
- ⊘RV13 (G LEVEL) /EN-64
- ⊘RV14 (B LEVEL) /EN-64

Procedure :

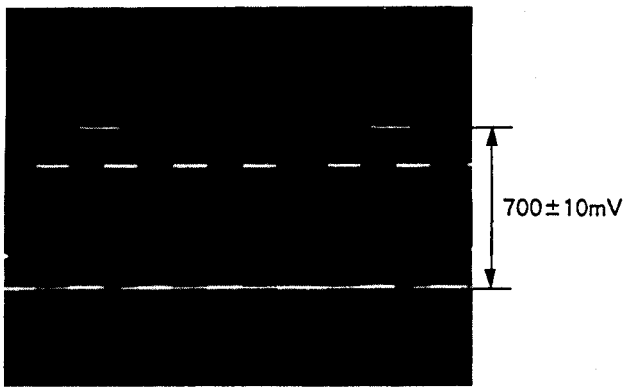
1. Adjust ⊘RV13 so that the amplitude at TP18 is 700±10mV.

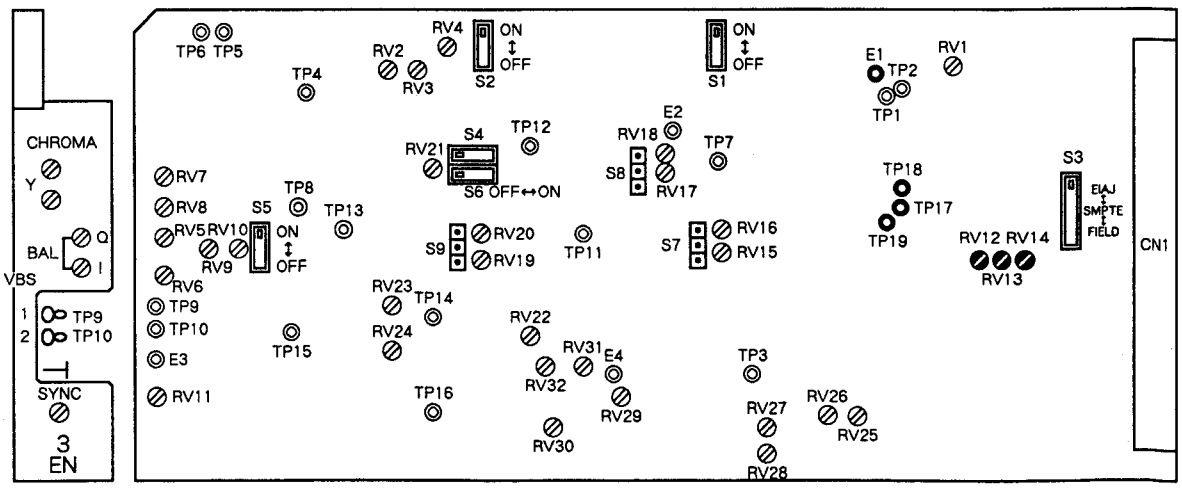


2. Adjust ⊘RV12 so that the amplitude at TP17 is 700±10mV.



3. Adjust ⊘RV14 so that the amplitude at TP19 is 700±10mV.



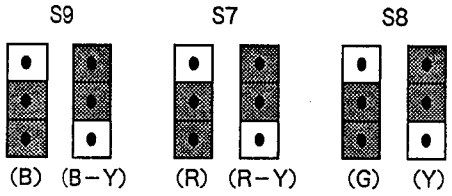


EN-64/64P BOARD (Component Side)

4-4. BETACAM Output Level Adjustment

Note

- When the output connector at the rear panel of the CCU is not terminated with 75 Ω terminator, measured value becomes double amplitude.
- Output signal can be selected by the setting of jumper switches S7, S8, and S9 as follows. In this adjustment, select R−Y, B−Y and Y positions.



Preparation

- OUTPUT switch/front panel → BARS

To be extended : EN-64
Equipment : Oscilloscope

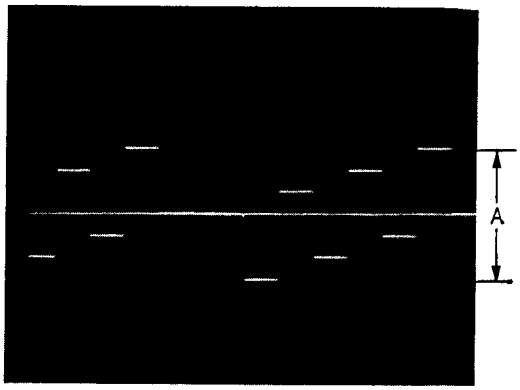
[B−Y Output Level Adjustment]

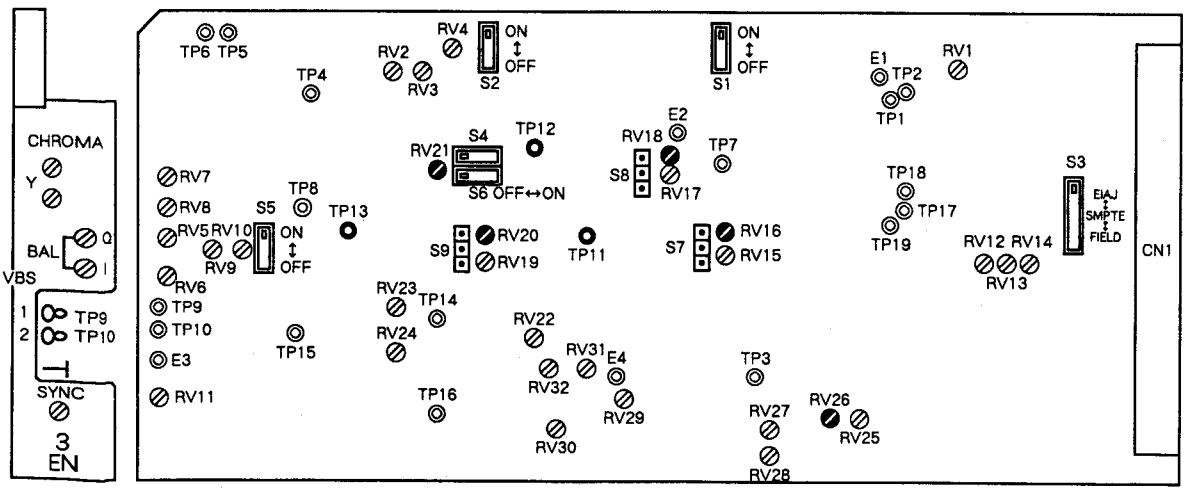
Test point : TP13/EN-64

Adj. point : ◐RV20 (B−Y LEVEL) /EN-64

Procedure :

1. Connect between the channel A of the waveform monitor and B/B−Y connector at the rear panel.
2. Adjust ◐ RV20 so that the level A is 1400±20mV.





EN-64/64P BOARD (Component Side)

[R－Y Output Level Adjustment]

Test point : TP11／EN-64

Adj. point : ⊘ RV16 (R－Y LEVEL) ／EN-64

Procedure :

1. Connect between the channel A of the waveform monitor and R／R－Y connector at the rear panel.
2. Adjust ⊘ RV16 so that the level A is 1400±20mV.

[Y Output Level Adjustment]

Preparation

- S4／EN-64 → ON

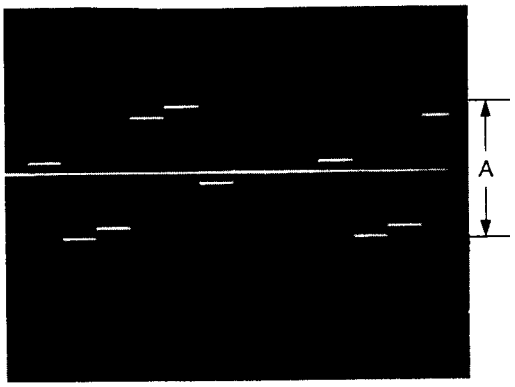
Test point : TP12／EN-64

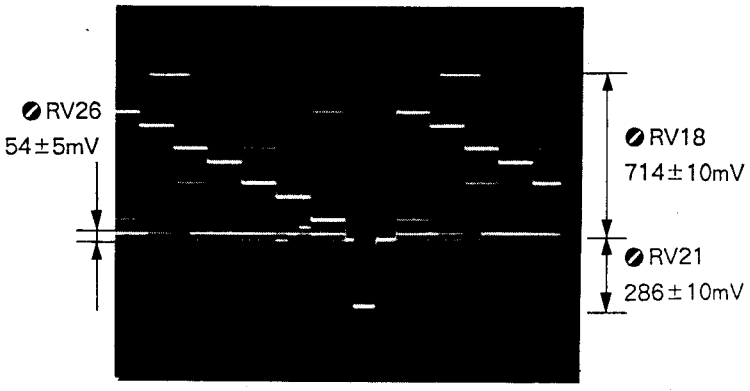
Adj. point :

- ⊘RV18 (Y LEVEL) ／EN-64
- ⊘RV26 (Y SETUP LEVEL) ／EN-64
- ⊘RV21 (SYNC LEVEL) ／EN-64

Procedure :

1. Adjust ⊘ RV18 so that the white peak is 714±10mV.
2. Adjust ⊘ RV26 so that the setup level is 54±5mV.
3. Adjust ⊘ RV21 so that the sync level is 286±10mV.
4. S4／EN-64 Board → OFF





4-5. VBS Y Level Adjustment

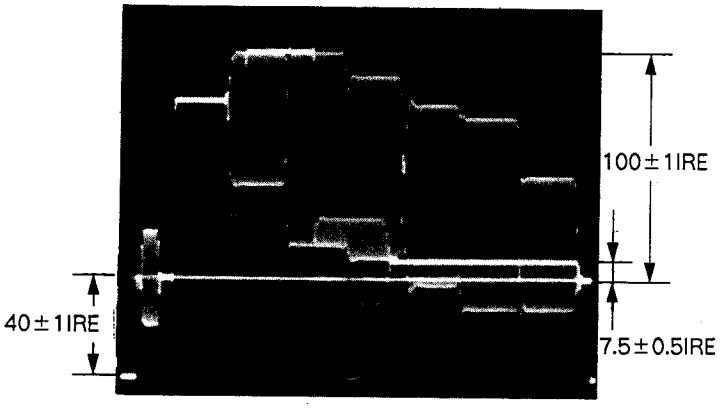
Preparation

• OUTPUT switch/front panel → BARS

To be extended : EN-64
Equipment : Waveform monitor

Adj. point :
- ● RV25 (VBS SETUP LEVEL) /EN-64
- ● RV8 (Y LEVEL) /EN-64
- ● RV11 (SYNC LEVEL) /EN-64

Procedure :
1. Adjust ● RV25 so that the setup level is 7.5± 0.5IRE.
2. Adjust ● RV8 so that the white peak is 100±1IRE.
3. Adjust ● RV11 so that the sync level is 40±1IRE.



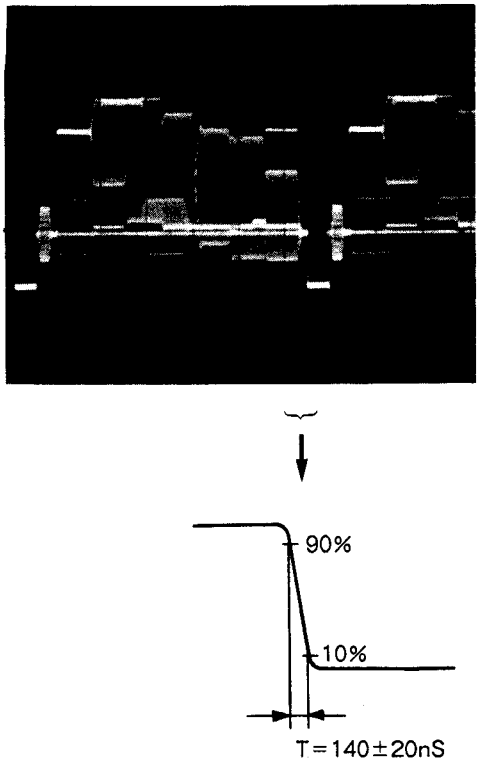
4-6. VBS SYNC Phase Adjustment

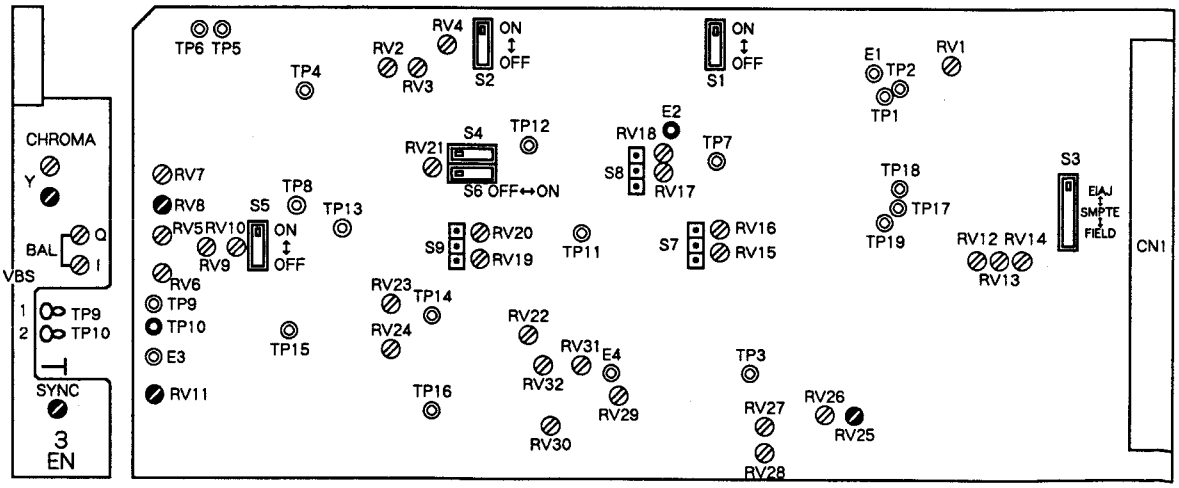
Preparation

• OUTPUT switch/front panel → BARS

To be extended : EN-64
Equipment : Oscilloscope
Waveform monitor
Test point : TP10/EN-64

Adj. point : ● LV3/EN-64
Specification : T=140±20nS





EN-64/64P BOARD (Component Side)

4-7. Color Bar Adjustment

Preparation

- OUTPUT switch/front panel → BARS
- S2 (Q) /EN-64 → OFF

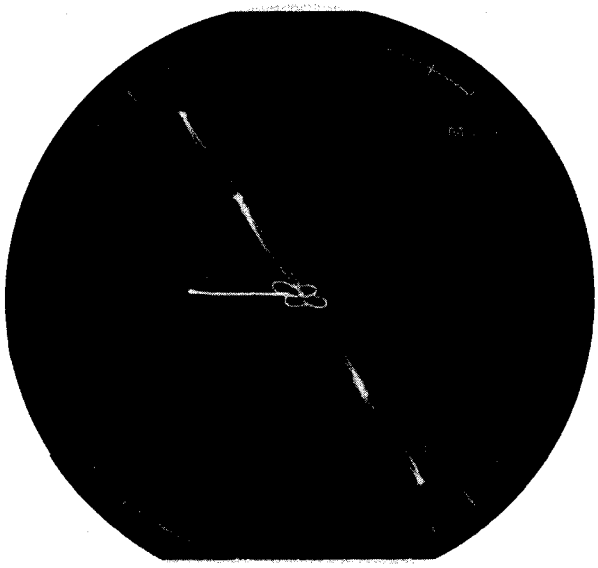
To be extended : EN-64
Equipment : Vectorscope

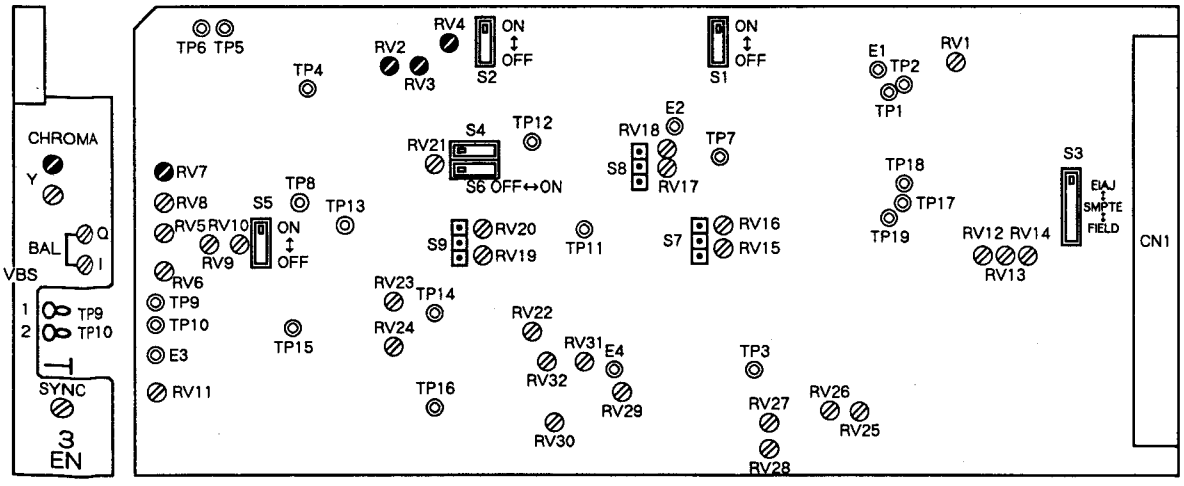
Adj. point :

- ◉RV7 (CHROMA LEVEL) /EN-64
- ◉RV2 (BURST LEVEL) /EN-64
- ◉RV3 (BURST PHASE) /EN-64
- ◉RV4 (Q/U GAIN) /EN-64
- ◉LV1 (SC PHASE) /EN-64

Procedure :

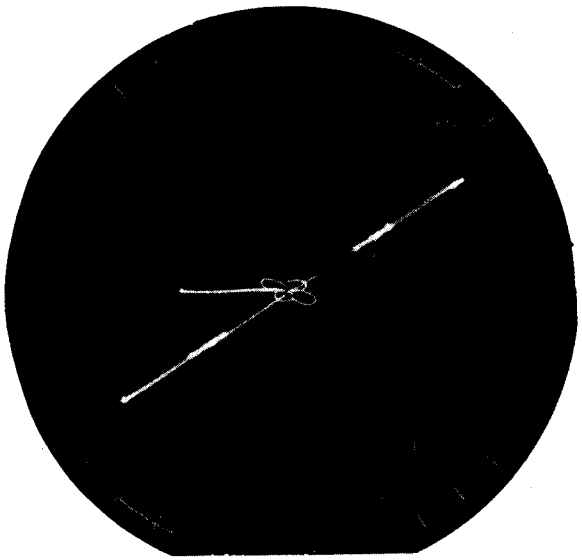
1. Adjust the PHASE control on the vectorscope so that the I signal is overlapped with I axis on the vectorscope.
2. Adjust ◉RV7 so that the beam spots at both ends of I signal are overlapped with I axis.





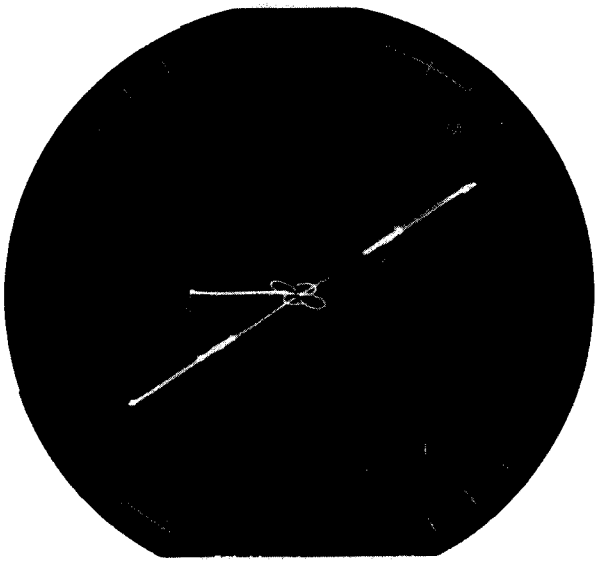
EN-64/64P BOARD (Component Side)

3. S1 (I) /EN-64→OFF
   S2 (Q) /EN-64→ON
4. Adjust the PHASE control on the vectorscope so that the Q signal is overlapped with Q axis.
5. Adjust ⊘RV4 so that the beam spots at both ends of Q signal are overlapped with Q axis.



6. S2 (Q) /EN-64→ON
7. Adjust the PHASE control on the vectorscope so that the Q signal is overlapped with Q axis.
8. Adjust ⊘LV1 so that the I signal is overlapped with I axis.

9. S1 (I) /EN-64→OFF
10. Adjust the PHASE control on the vectorscope so that the burst signal is overlapped with 75% axis of the vectorscope.
11. Adjust ⊘RV3 so that the Q signal is overlapped with Q axis.



12. Adjust ⊘RV2 so that the BURST signal is overlapped with 75% scale on the vectorscope.
13. S1 (I) /EN-64→ON
14. Confirm that the all beam spots of color bar signal are located in the specified area "⊞" on the vectorscope. If not, readjust this adjustment.

4-8. VBS/VB Level Adjustment

Preparation

- Connect the output cable to the VBS / VB connector.
- OUTPUT switch/front panel → TEST

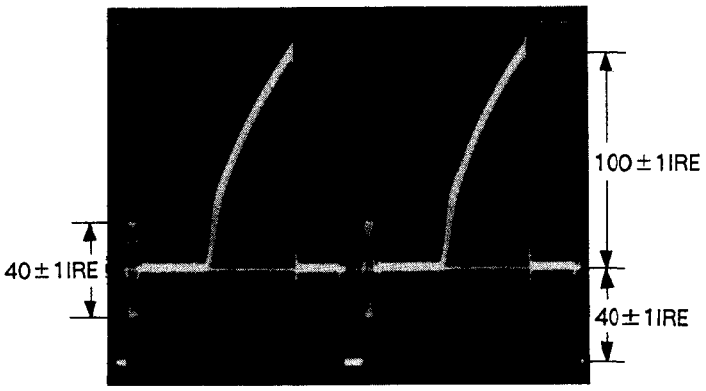
To be extended : EN-64
Equipment : Waveform monitor
Test point : Waveform monitor

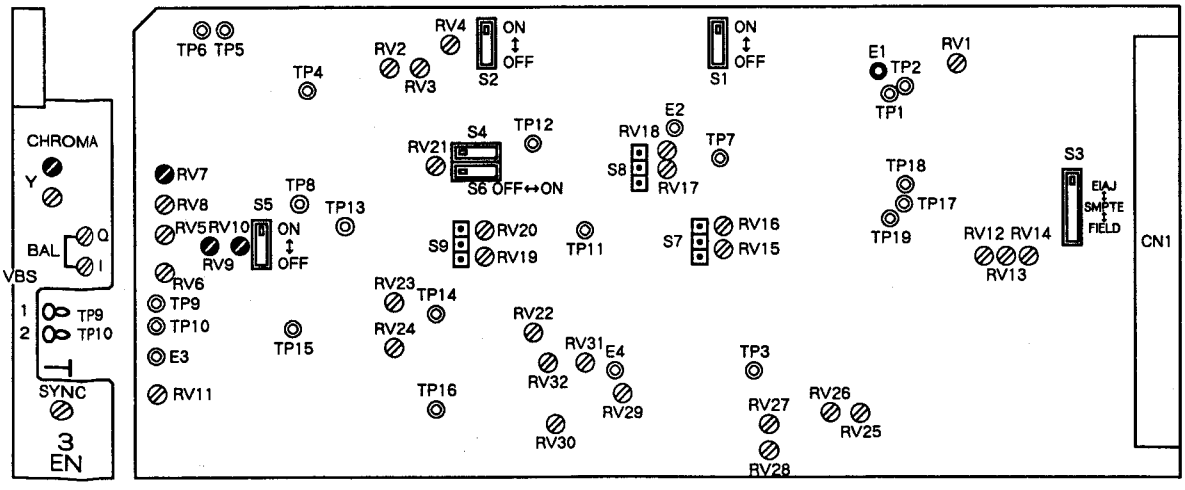
Adj. point :

- ⊘RV7 (CHROMA LEVEL) /EN-64
- ⊘RV9 (VBS2 OUTPUT LEVEL) /EN-64
- ⊘RV10 (SYNC LEVEL) /EN-64

Procedure :

1. Adjust ⊘RV9 so that the white peak level is 100 ±1IRE.
2. Adjust ⊘RV7 so that the burst level is 40±1IRE.
3. Adjust ⊘RV10 so that the sync level is 40±1IRE.
4. After the adjustment, connect the output cable to the VBS connector.





EN-64/64P BOARD (Component Side)

4-9. WF Output Level Adjustment

Note

- When the WF output connector at the rear panel of the CCU is not terminated with 75Ω terminator, measured value becomes double amplitude.
- This adjustment should be performed only when potentiometer is replaced to new one.
- Selection of output signal to the WF output connector will carry out by applying + 5V to the extension board's test terminal. Therefore, in order to protect ICs, be sure to remove chip resistors R37 through R40 on the AT-65 board.

	Extension Board			
	35 pin	34 pin	33 pin	32 pin
ENC	0	0	0	0
R	0	1	0	0
G	0	0	1	0
B	0	1	1	0

1 : 5V
0 : 0V

Preparation

- Connect between the channel A of the waveform monitor and the WF output connector at the rear panel.
- G signal can be output by applying + 5V to pin 33 on the extension board from the DC power supply.

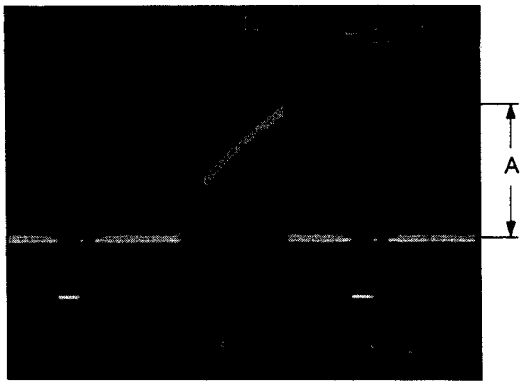
To be extended: EN-64
Equipment: Oscilloscope
Test point: TP16/EN-64

Adj. point:

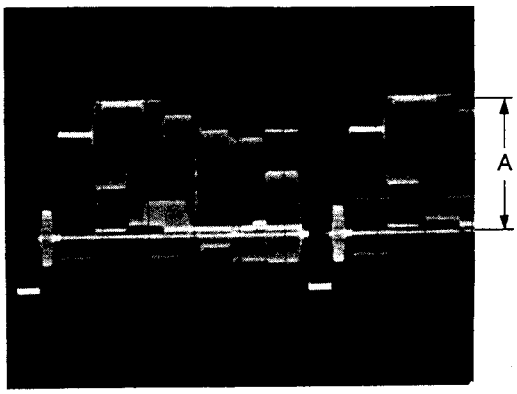
- ◐RV30 (WFM LEVEL) /EN-64
- ◐RV29 (WFM VBS LEVEL) /EN-64

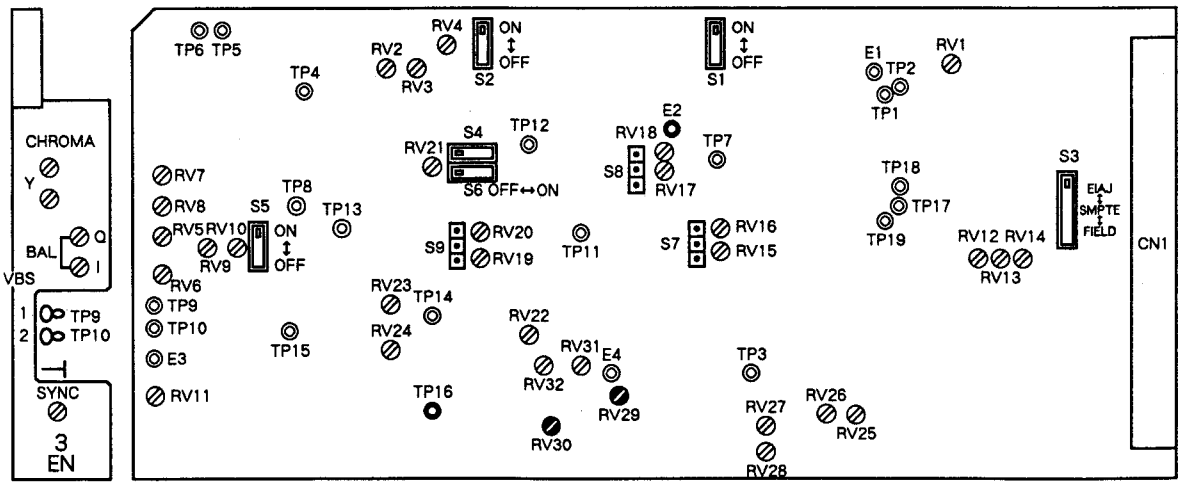
Procedure:

1. OUTPUT switch/front panel→TEST
2. Adjust ◐RV30 so that the level A is 1400 ± 20mV.



3. OUTPUT switch/front panel→BARS
4. Adjust ◐RV29 so that the level A is 1400 ± 20mV.





EN-64/64P BOARD (Component Side)

4-10. DC Offset Adjustment

Note

- This adjustment should be performed only when potentiometer is replaced to new one.
- Selection of output signal to the WF output connector will carry out by applying + 5V to the extension board's test terminal. Therefore, in order to protect ICs, be sure to remove chip resistors R37 through R40 on the AT-65 board.

	Extension Board			
	35 pin	34 pin	33 pin	32 pin
ENC	0	0	0	0
R	0	1	0	0
G	0	0	1	0
B	0	1	1	0

1 : 5V
0 : 0V

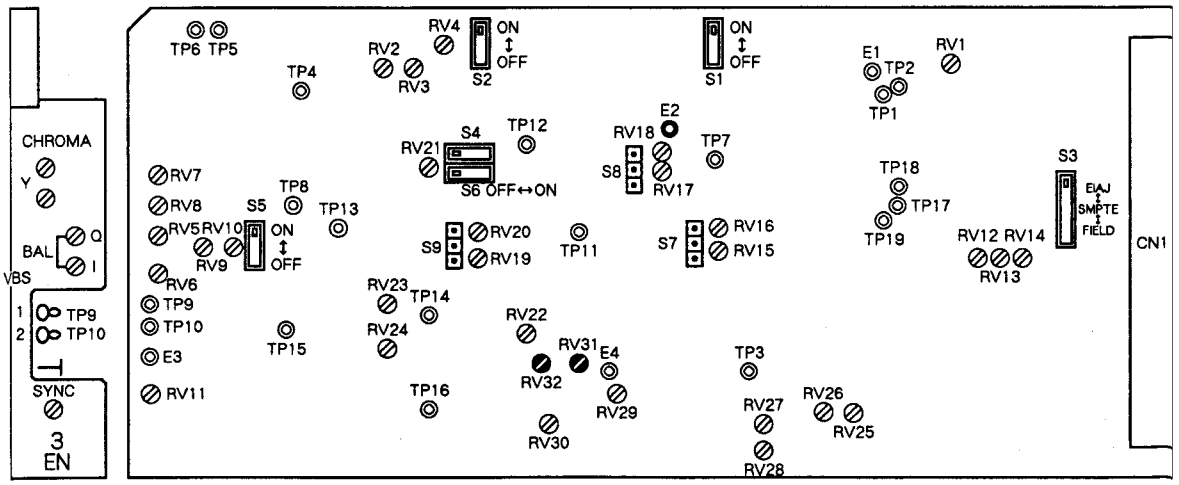
Preparation

- OUTPUT switch/front panel→TEST
- Connect between the channel A of the waveform monitor and the WF connector at the rear panel.

To be extended: EN-64
Equipment: Waveform monitor

Adj. point:

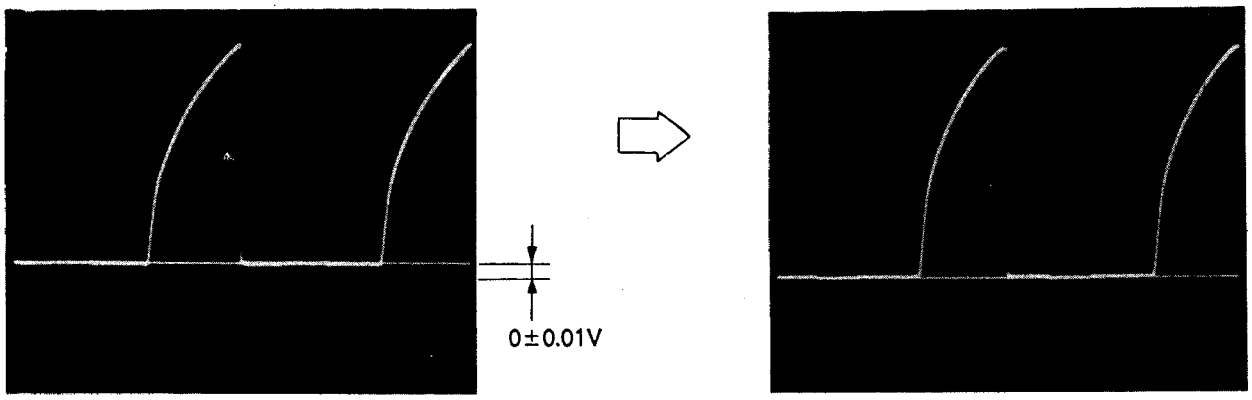
- RV31 (WFM R LEVEL) /EN-64
- RV32 (WFM B LEVEL) /EN-64



EN-64/64P BOARD (Component Side)

Procedure :

1. Set the DC RESTORER button on the waveform monitor to OFF.
2. Apply +5V to pin 33 on the extension board from the DC power supply in order to select the G signal.
3. Adjust VERTICAL POSITION control on the waveform monitor so that the pedestal level is overlapped to the reference line.
4. Apply +5V to pin 34 on the extension board from the DC power supply in order to select the R signal.
5. Adjust ⊘RV31 so that the offset level of the R signal and G signal are equal.



R and B signals

G signal

6. Apply +5V to pins 33 and 34 on the extension board from the DC power supply in order to select the B signal.
7. Adjust ⊘RV32 so that the offset level of the B signal and G signal are equal.
8. After the adjustment, set the DC RESTORER switch on the waveform monitor to SLOW position.

4-11. STAIR CASE Adjustment

Preparation

- Connect by the 4-pin connector (supplied accessories) between WF MODE OUT connector at the rear panel and the waveform monitor.
- In order to set the waveform monitor in the SEQUENTIAL mode, apply +5V to pin 35 on the extension board from the DC power supply.
- OUTPUT switch/front panel→CAM
- Adjust the zoom control so that the pattern box frame touches the underscanned picture frame on the monitor.

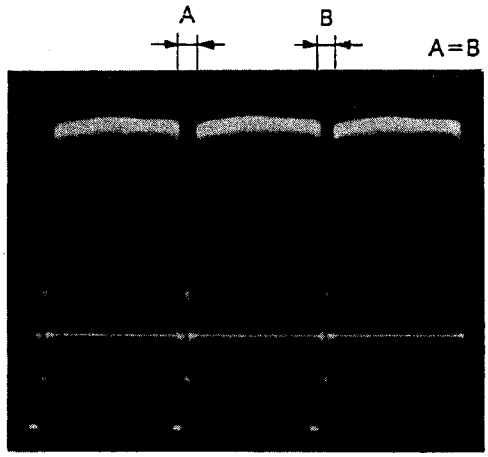
To be extended : EN-64
Equipment : Oscilloscope
Test point : TP51/extension board
Trigger : TP36 (VD) /extension board

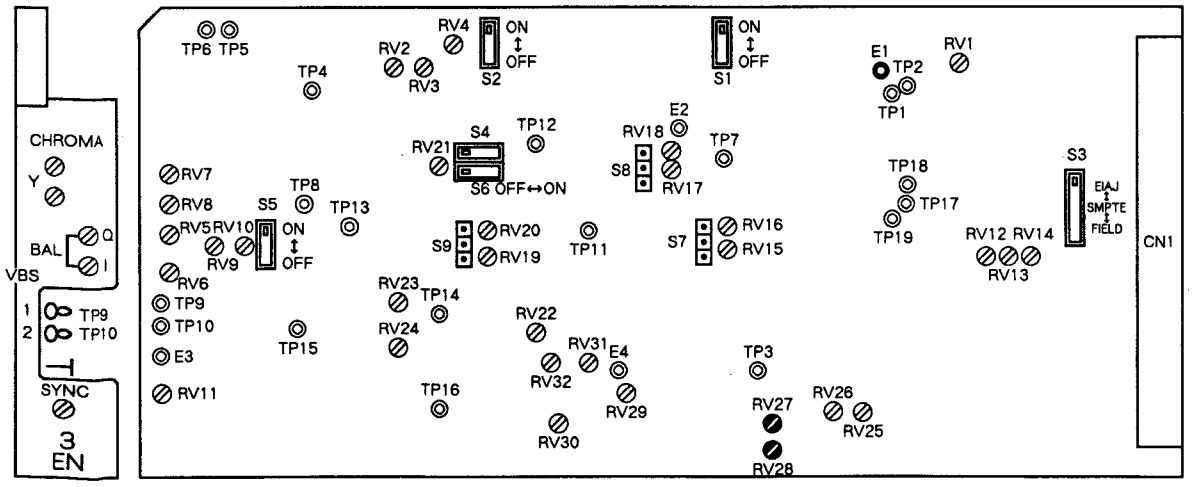
Adj. point :

- ●RV27 (STAIR STEP GAIN) /EN-64
- ●RV28 (STAIR STEP DC) /EN-64

Procedure :

1. Adjust ●RV27 and ●RV28 so that the interval among three waveforms is equal.





EN-64/64P BOARD (Component Side)

4-12. PIX Output Adjustment

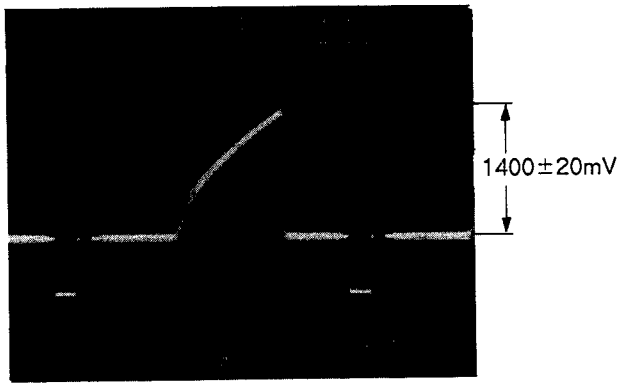
Preparation

- Connect between the channel A of the waveform monitor and the PIX connector at the rear panel.
- MONITOR SELECT button/front panel→G

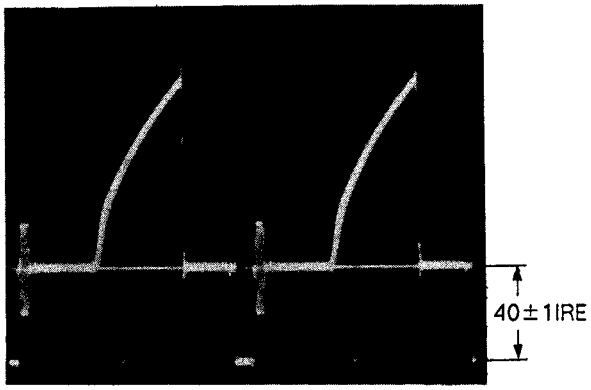
To be extended : EN-64
Equipment : Oscilloscope
Waveform monitor
Test point : TP15/EN-64

Adj. point :
- ⊘RV22 (PIX SYNC LEVEL) /EN-64
- ⊘RV23 (PIX VBS LEVEL) /EN-64
- ⊘RV24 (PIX LEVEL) /EN-64

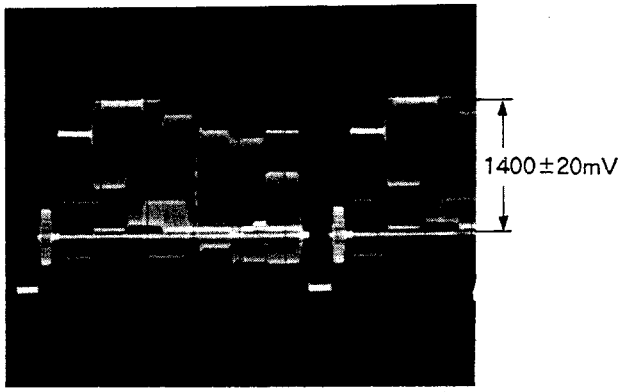
Procedure :
1. OUTPUT switch/front panel→TEST
2. Adjust ⊘RV24 so that the TEST SAW peak level is 1400±20mV.

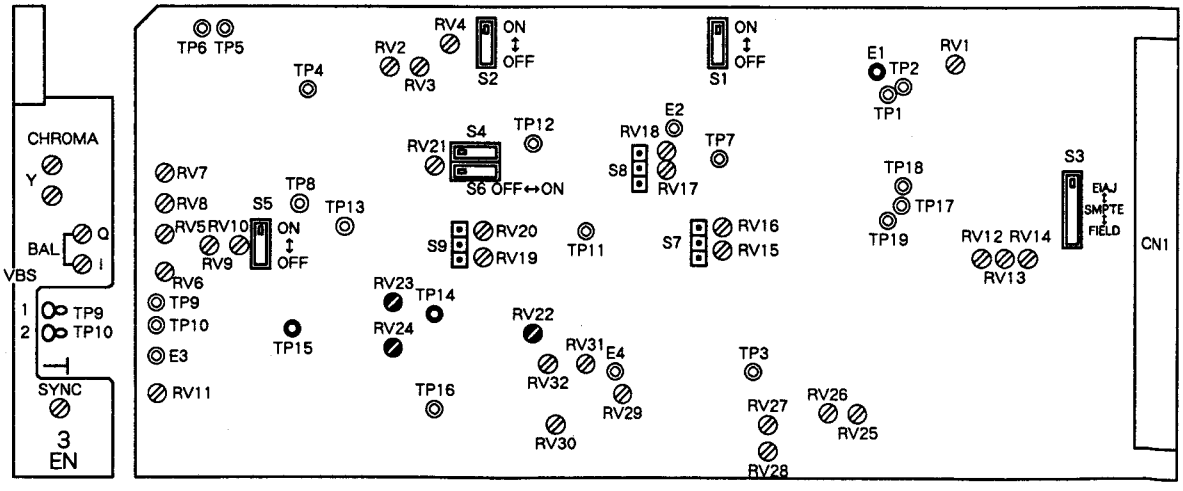


3. Adjust ⊘RV22 so that the sync level on the waveform monitor is 40±1IRE.



4. MONITOR SELECT button/front panel→ENC
5. OUTPUT switch/front panel→BAR
6. Adjust ⊘RV23 so that the white peak is 1400 ±20mV.





EN-64/64P BOARD (Component Side)

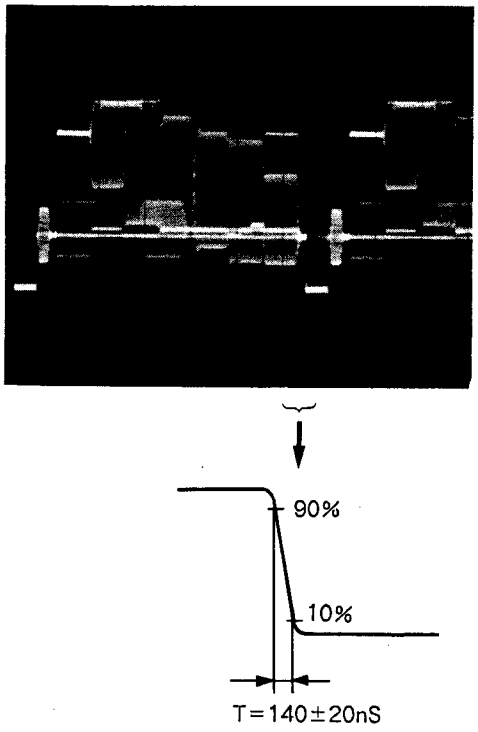
4-13. PIX SYNC Phase Adjustment

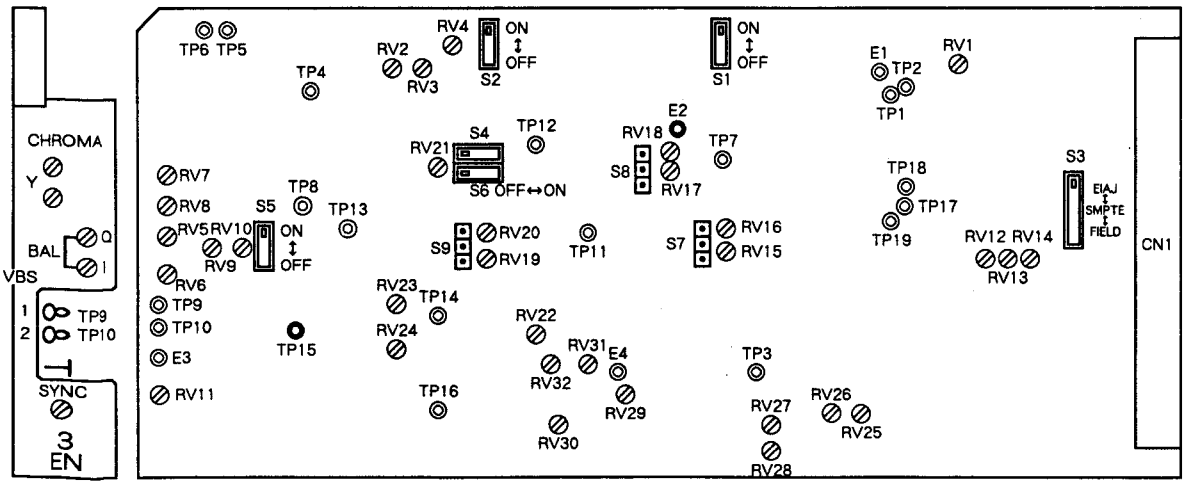
Preparation

- OUTPUT switch/front panel → BARS
- MONITOR SELECT button/front panel → ENC

To be extended : EN-64
Equipment : Oscilloscope
Test point : TP15/EN-64

Adj. point : ◐LV2 (SYNC PHASE)
Specification : T=140±20nS





EN-64/64P BOARD (Component Side)

STEP 5. CONTROL SYSTEM ADJUSTMENT (IF-177 Board)

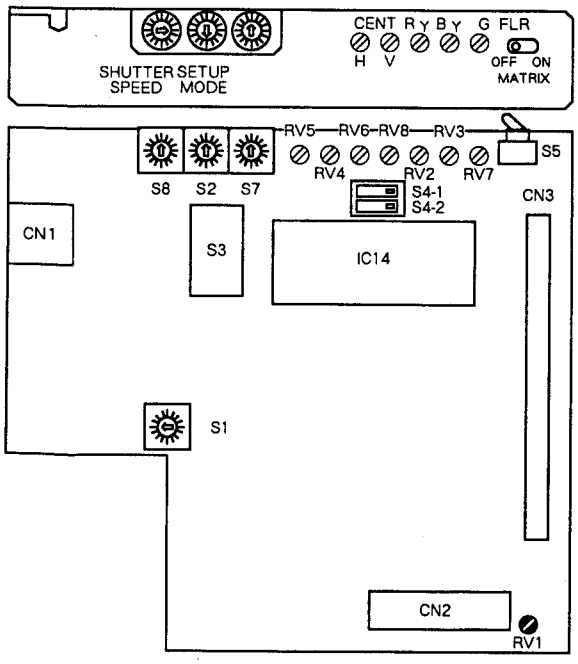
5-1. Iris Control Setting

Preparation

- AUTO/MAN switch/front panel → MAN
- IRIS CONTROL /front panel
  →○ fully counterclockwise

Adj. point : ⊘RV1 (IRIS CLS SET) /IF-177

Specification : Adjust ⊘RV1 so that the lens iris moves and stays at the "C" position.



IF-177 BOARD (Component Side)

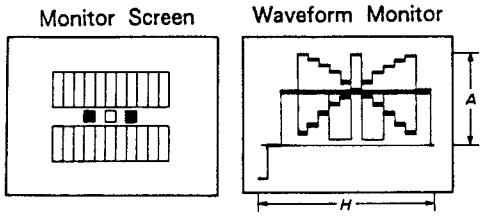
5-2. R/B Gamma Adjustment

Preparation

- ENC/REGI switch/BVP-350 side panel → REGI
- R/G/B switch/BVP-350 side panel → G
- −G/OFF switch/BVP-350 side panel → OFF

Object : Gray scale chart (Chart frame=underscan monitor frame)

Lens iris : A=100±2IRE

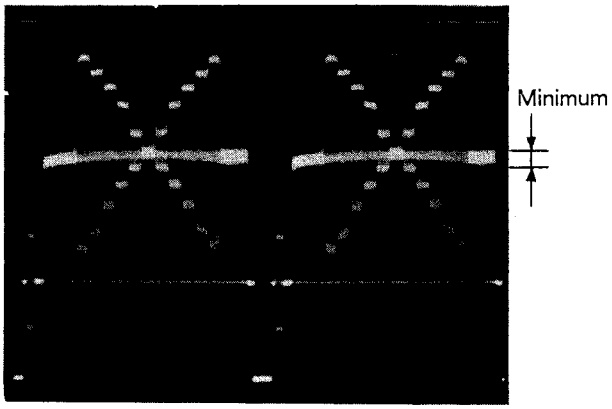


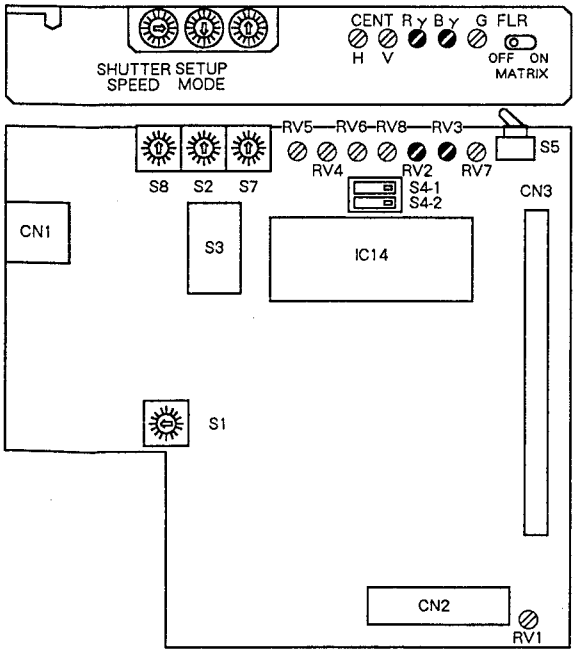
Adj. point :

- ⊘RV2 (R γ) /IF-177
- ⊘RV3 (B γ) /IF-177

Procedure :

1. Set the waveform monitor to mode A, and adjust ⊘RV2 and ⊘RV3 so that the carrier leak at the cross point on the gray scale minimize.





IF-177 BOARD (Component Side)

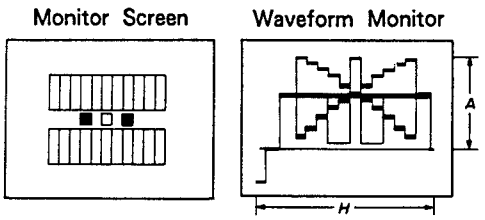
5-3. Flare Adjustment

Preparation

- S4 (FLARE) switch/IF-177 → ON
- [ENC/REGI] switch/BVP-350 side panel → [REGI]
- [R/G/B] switch/BVP-350 side panel → [G]
- [−G/OFF] switch/BVP-350 side panel → [OFF]

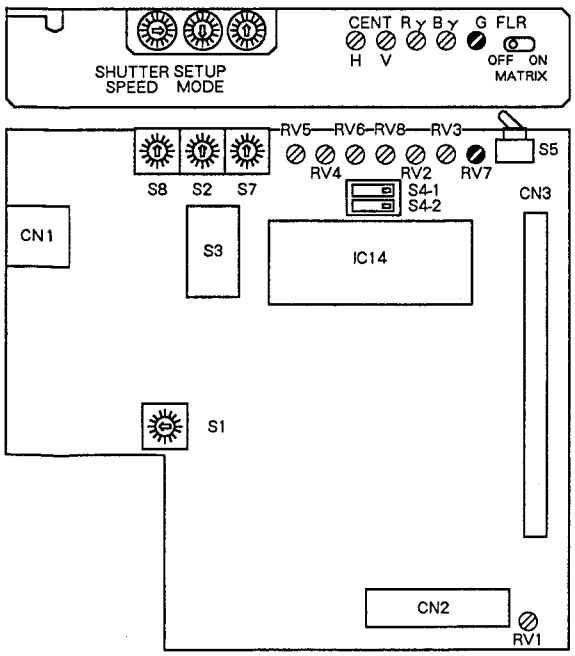
Object : Gray scale chart (Chart frame = underscan monitor frame)

Lens iris : A = 100 ± 2IRE



Adj. point :

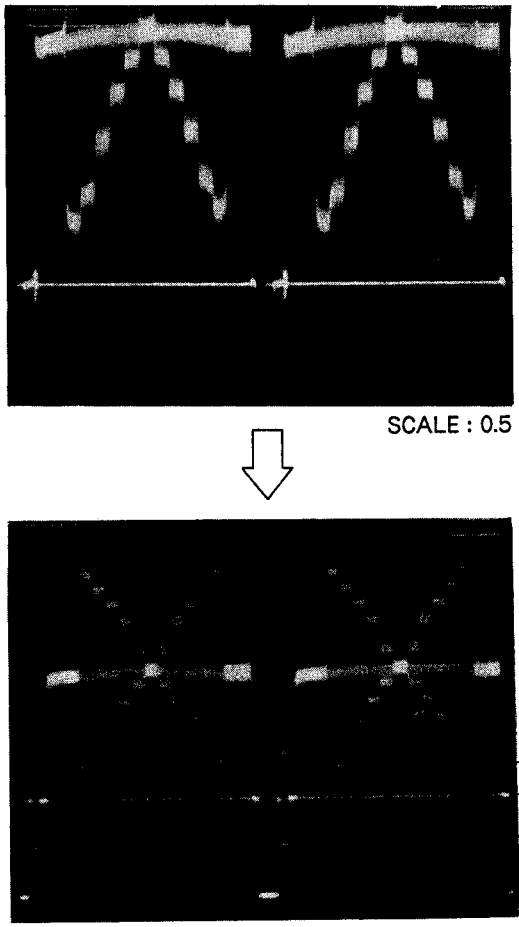
- ⊘ RV7 (G FLR) /IF-177
- BLACK control : Right (R FLR) /front panel
- BLACK control : Left (B FLR) /front panel



IF-177 BOARD (Component Side)

Procedure :

1. Set the waveform monitor to mode A. Adjust BLACK control on the front panel so that the carrier leak at the black level portion is minimum.
2. Set the waveform monitor to mode B. Adjust ⊘ RV7 so that black level is 4IRE.



5-4. R/B Registration (H/V CENT) Adjustment

Note

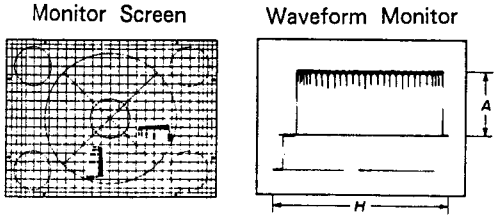
- Confirm that the pedestal adjustment of the camera is completely aligned.

Preparation

- OUTPUT switch/front panel → CAM
- ENC/REGI switch/BVP-350 side panel → REGI
- R/G/B switch/BVP-350 side panel → R
- −G/OFF switch/BVP-350 side panel → −G

Object : Registration chart (Chart frame=underscan monitor frame)

Lens iris : A=100IRE

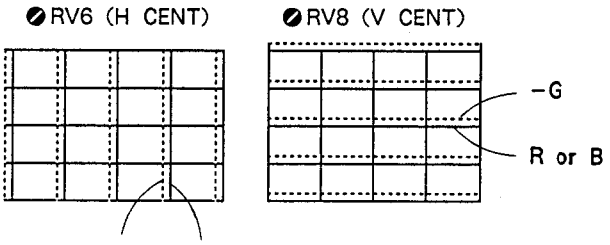


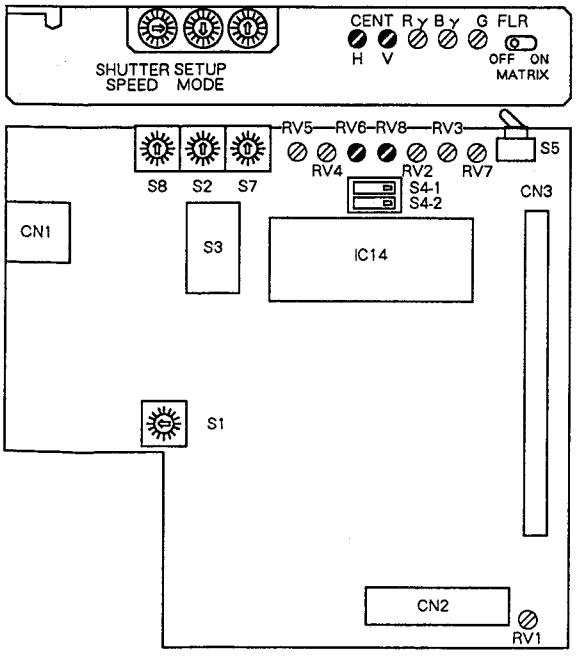
Adj. point :

- RV6 (H CENT) /IF-177
- RV8 (V CENT) /IF-177

Procedure :

1. Set the MONITOR SELECT button to R and −G, and adjust RV6 and RV8 for the best possible registration on channel R.
2. Set the MONITOR SELECT button to B and −G, and adjust RV6 and RV8 for the best possible registration on channel B.



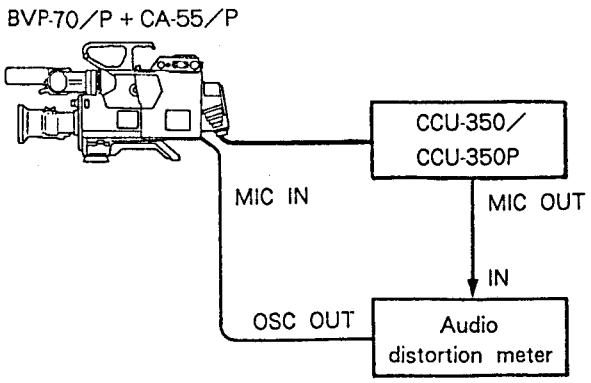


IF-177 BOARD (Component Side)

STEP 6. INTERCOM SYSTEM ADJUSTMENT (AU-98 Board)

6-1. Mic Level Adjustment

Connection



To be extended : AU-98
Equipment : Audio distortion meter

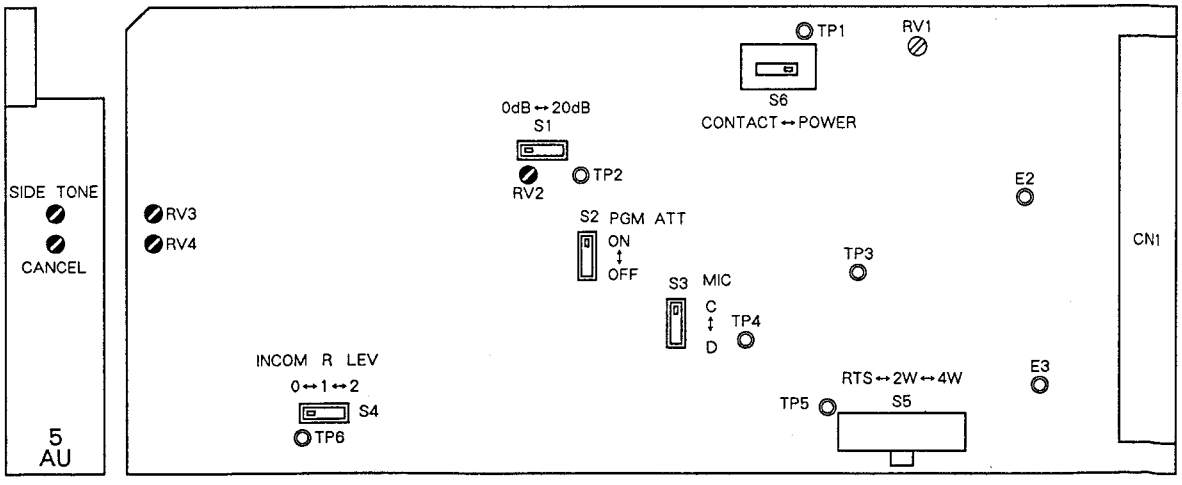
Adj. point : ⊘RV2 (MIC LEVEL) /AU-98

Procedure :
1. Set the audio distortion meter as follows.
   • FUNCTION ····· LEVEL
   • INPUT ATT ····· 20dB
   • METER RANGE····· −10dB
   • FREQ. RANGE····· 1kHz
2. Adjust ⊘ RV2 so that the meter indication is −10dB.

6-2. Side Tone/Cancel Adjustment

Adj. point :
• ⊘RV3 (SIDE TONE) /AU-98
• ⊘RV4 (CANCEL) /AU-98

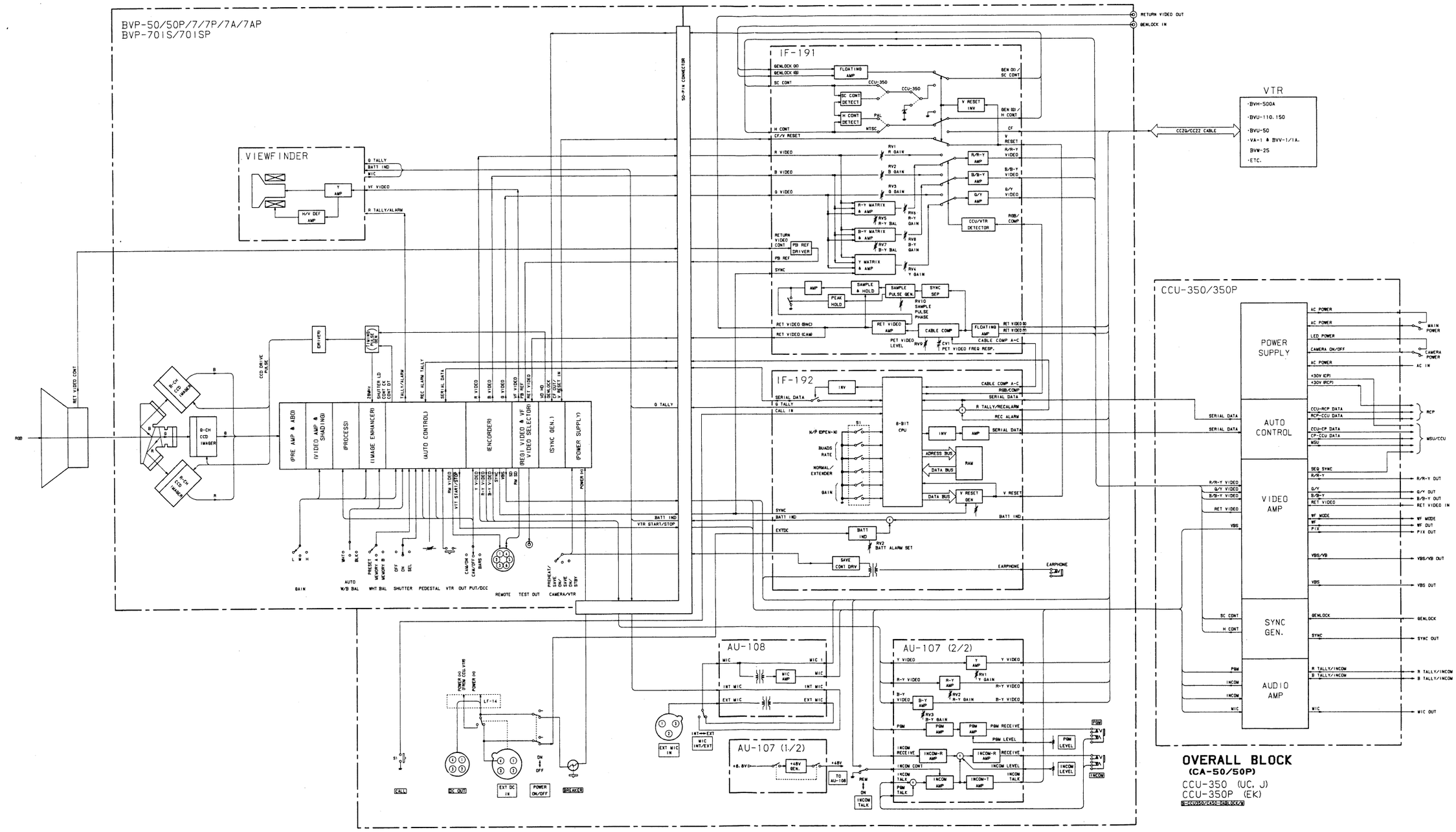
Adjust :
• ⊘RV3 (SIDE TONE) is an adjustment control for the sound balance for intercommunication.
  Set the SIDE TONE control so that the sound level is satisfactory.
• Perform the ⊘RV4 (CANCEL) adjustment when the intercom is "RTS" or "2-wires".
  In this adjustment, returned own voice level to the CCU other than side tone minimize.



AU-98 BOARD (Component Side)

SECTION A
BLOCK DIAGRAM

OVERALL BLOCK DIAGRAM



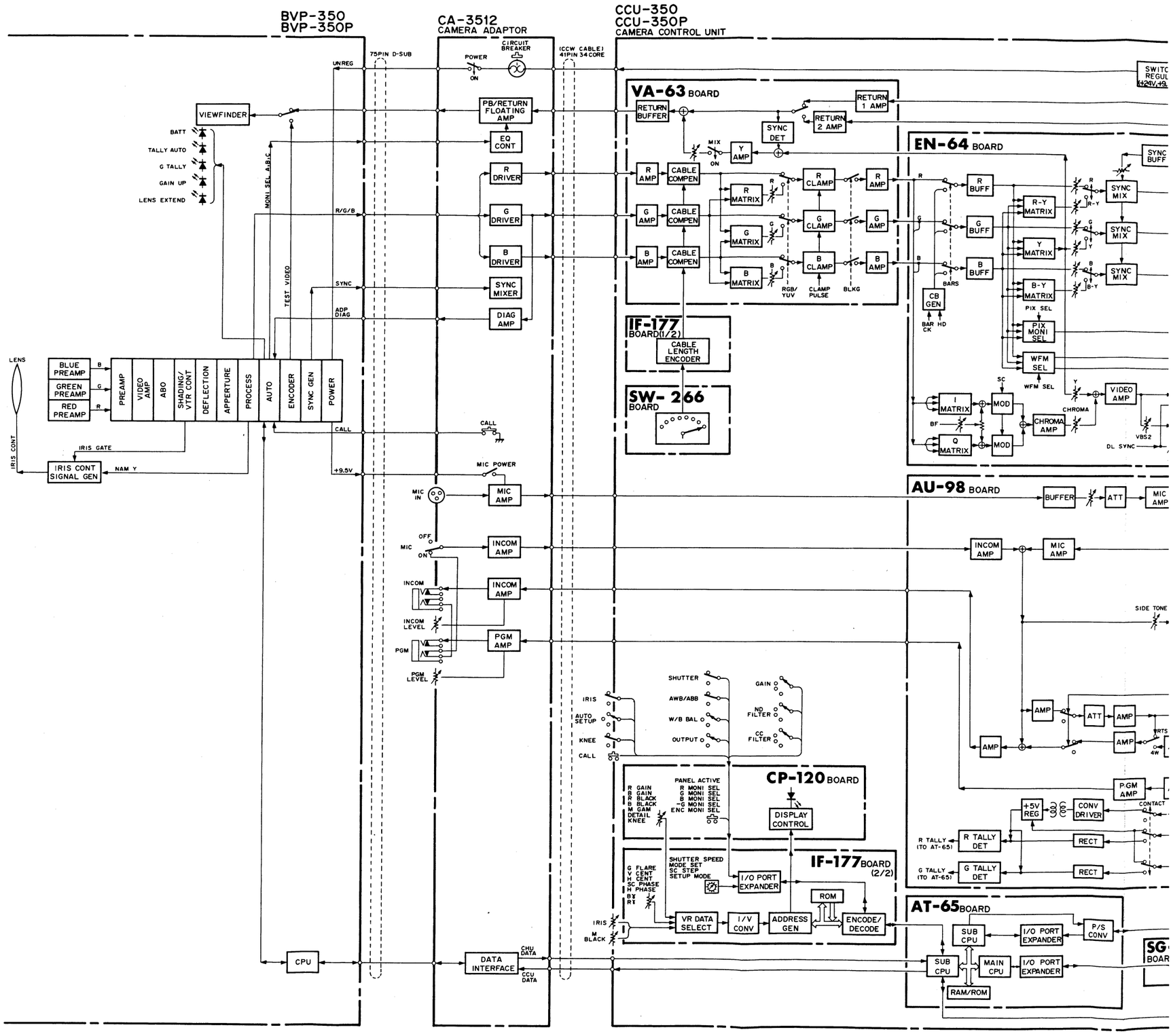
OVERALL BLOCK
(CA-50/50P)
CCU-350 (UC, J)
CCU-350P (EK)
9-CCU350/CA50-OVERALL

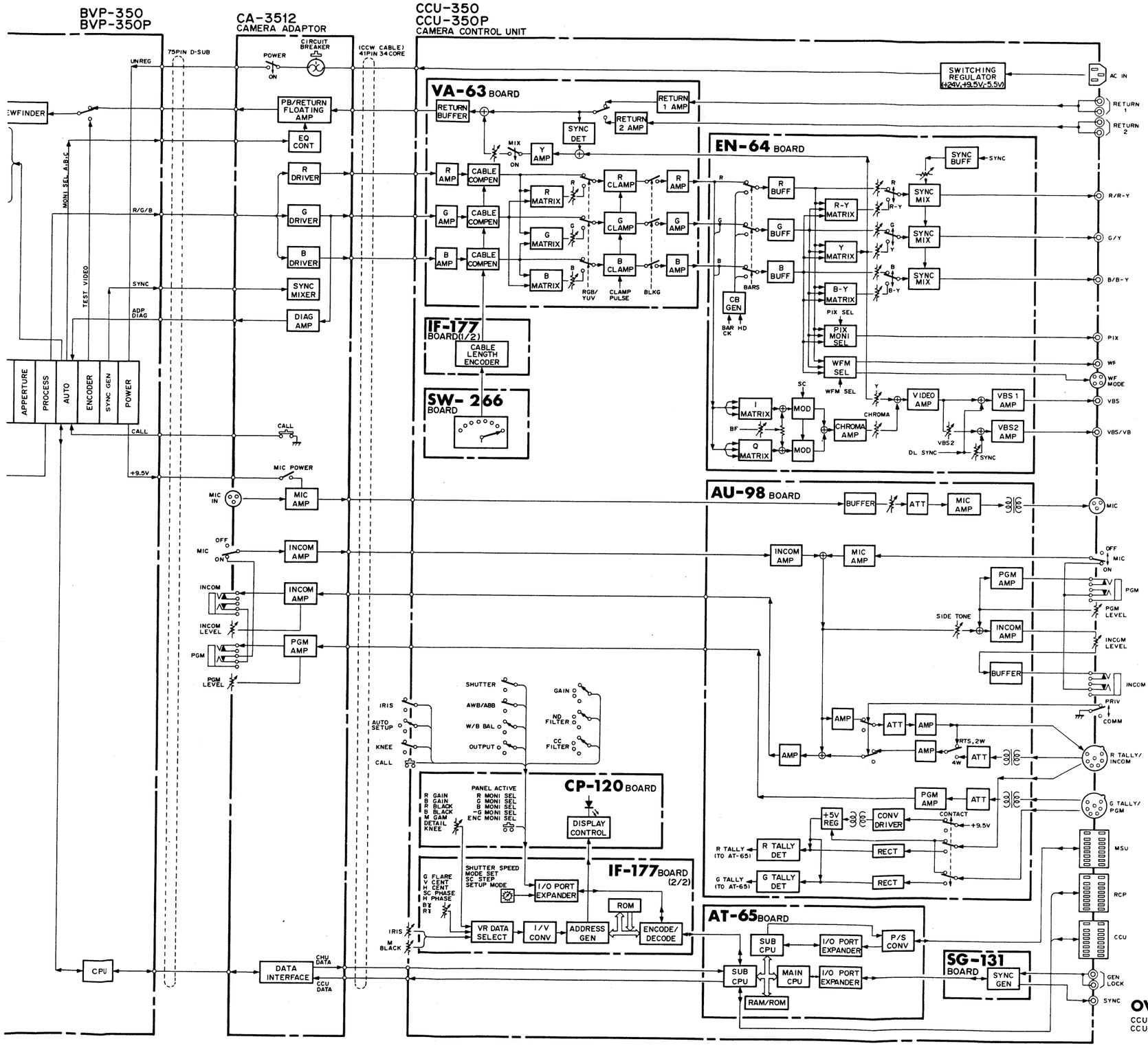
CCU-350 (UC, J)
CCU-350P (EK)

A-1 (a)

A-2 (a)

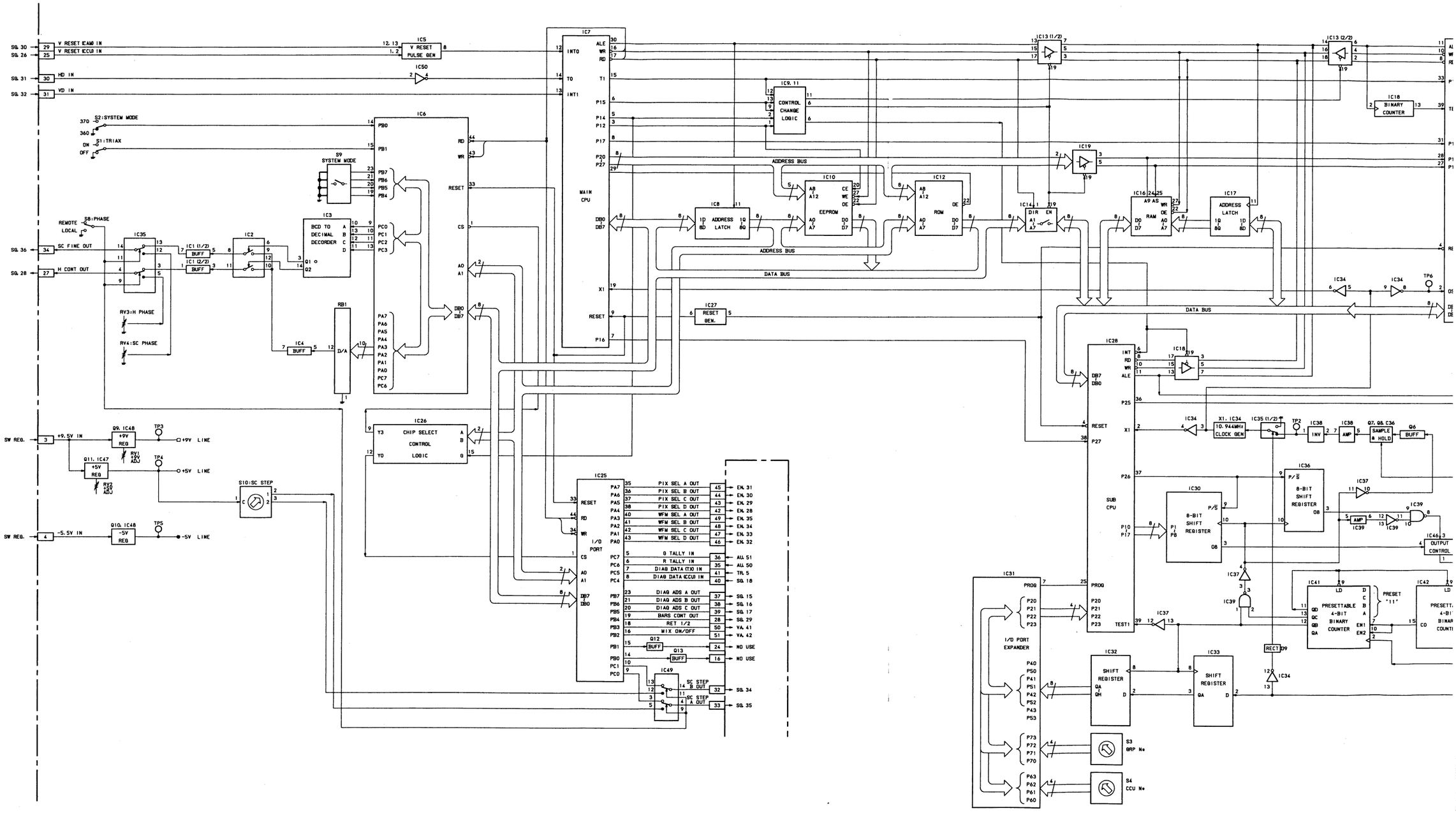
OVERALL BLOCK DIAGRAM



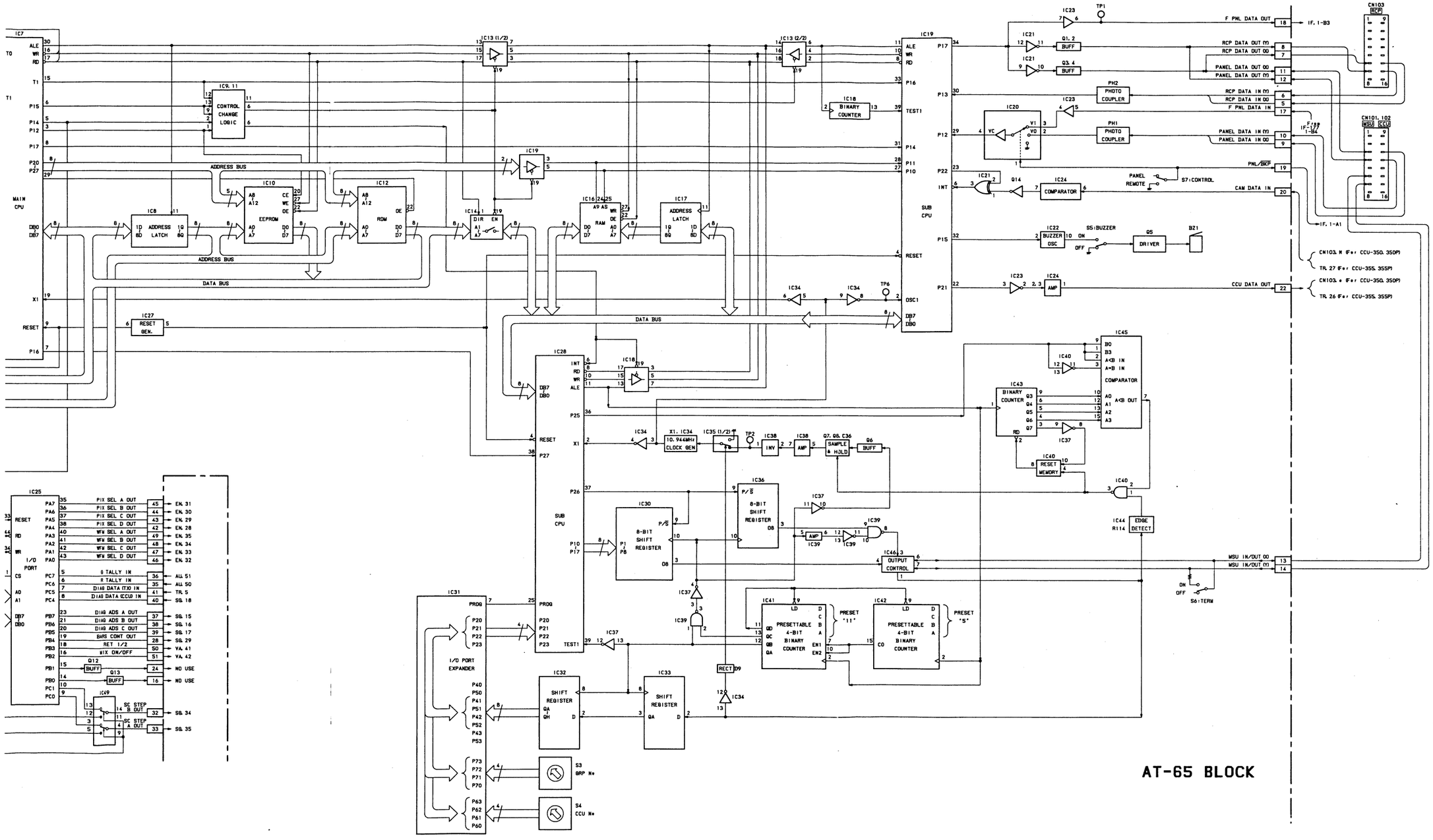


OVERLL BLOCK
CCU-350(UC,J)
CCU-350P(EK)

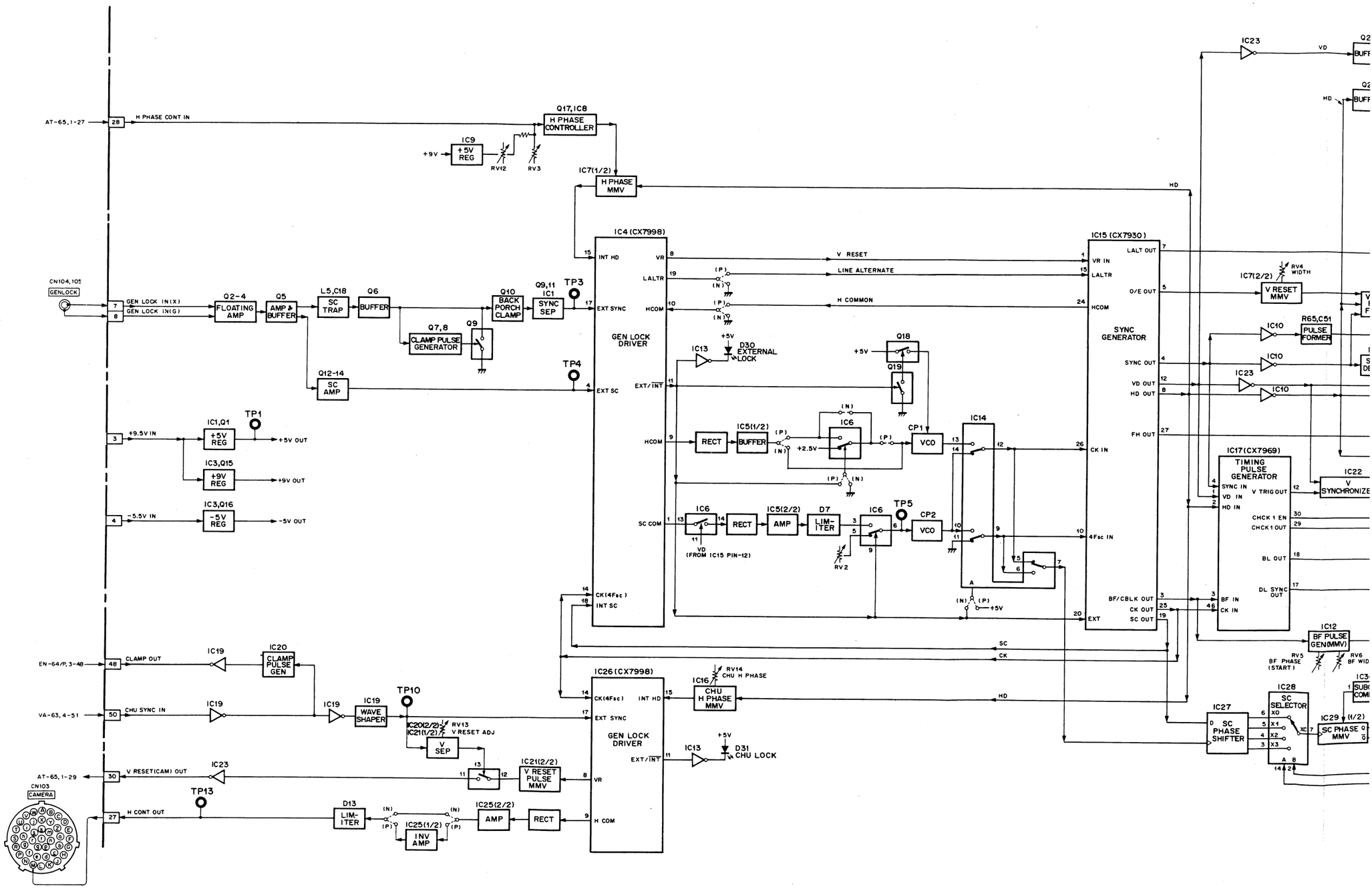
AT-65 BLOCK DIAGRAM



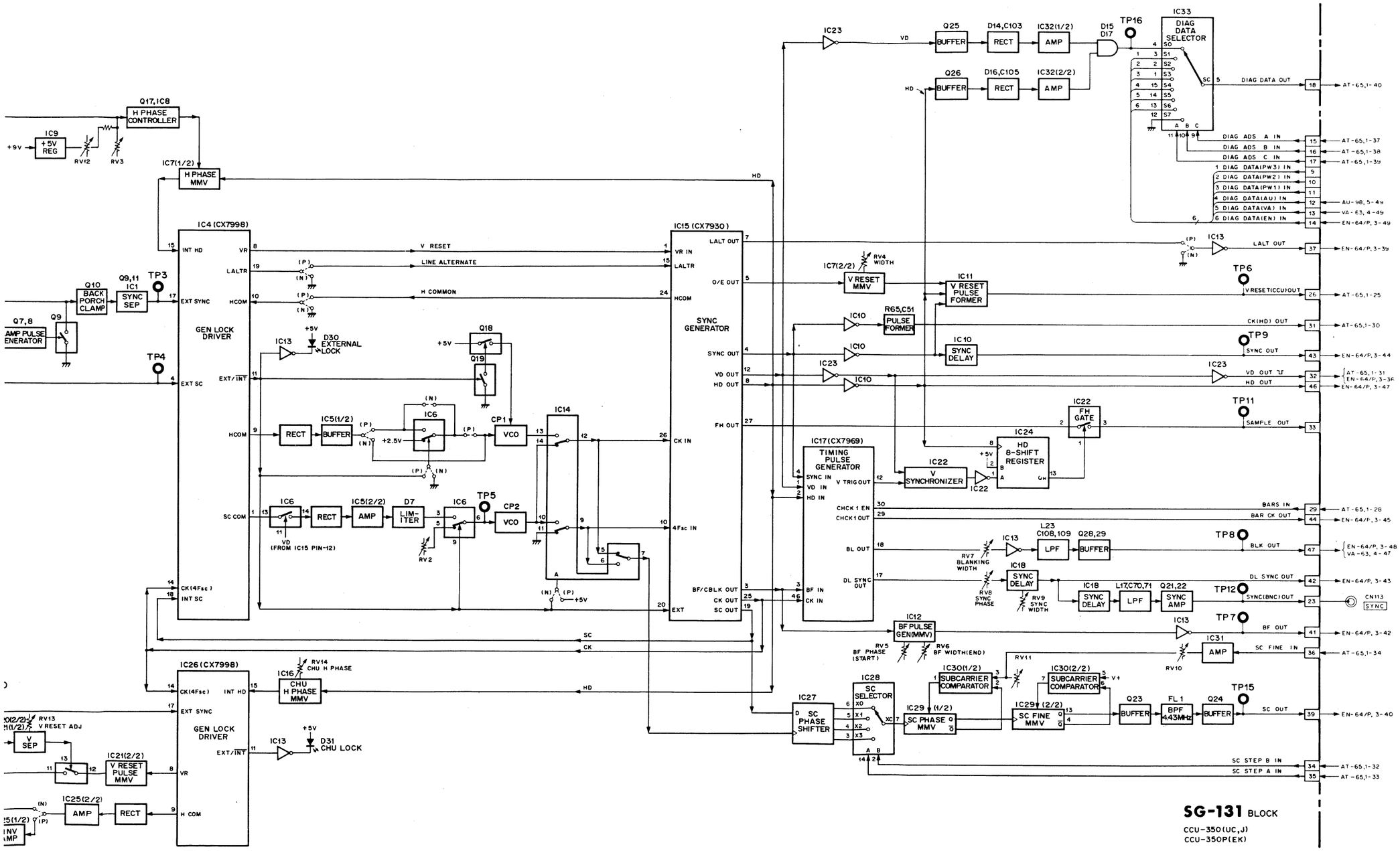
AT-65 BLOCK DIAGRAM



SG-131 BLOCK DIAGRAM

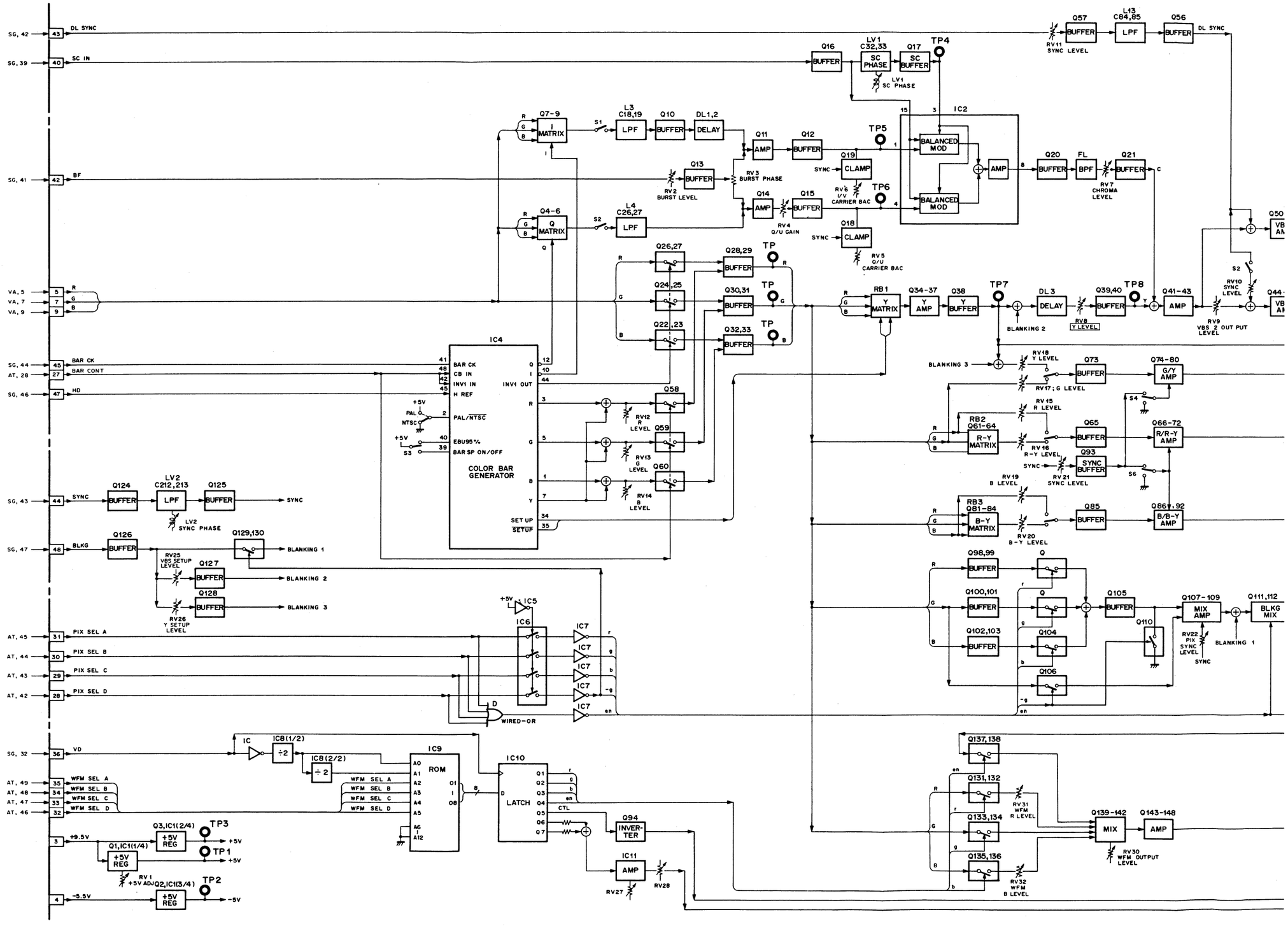


SG-131 BLOCK DIAGRAM



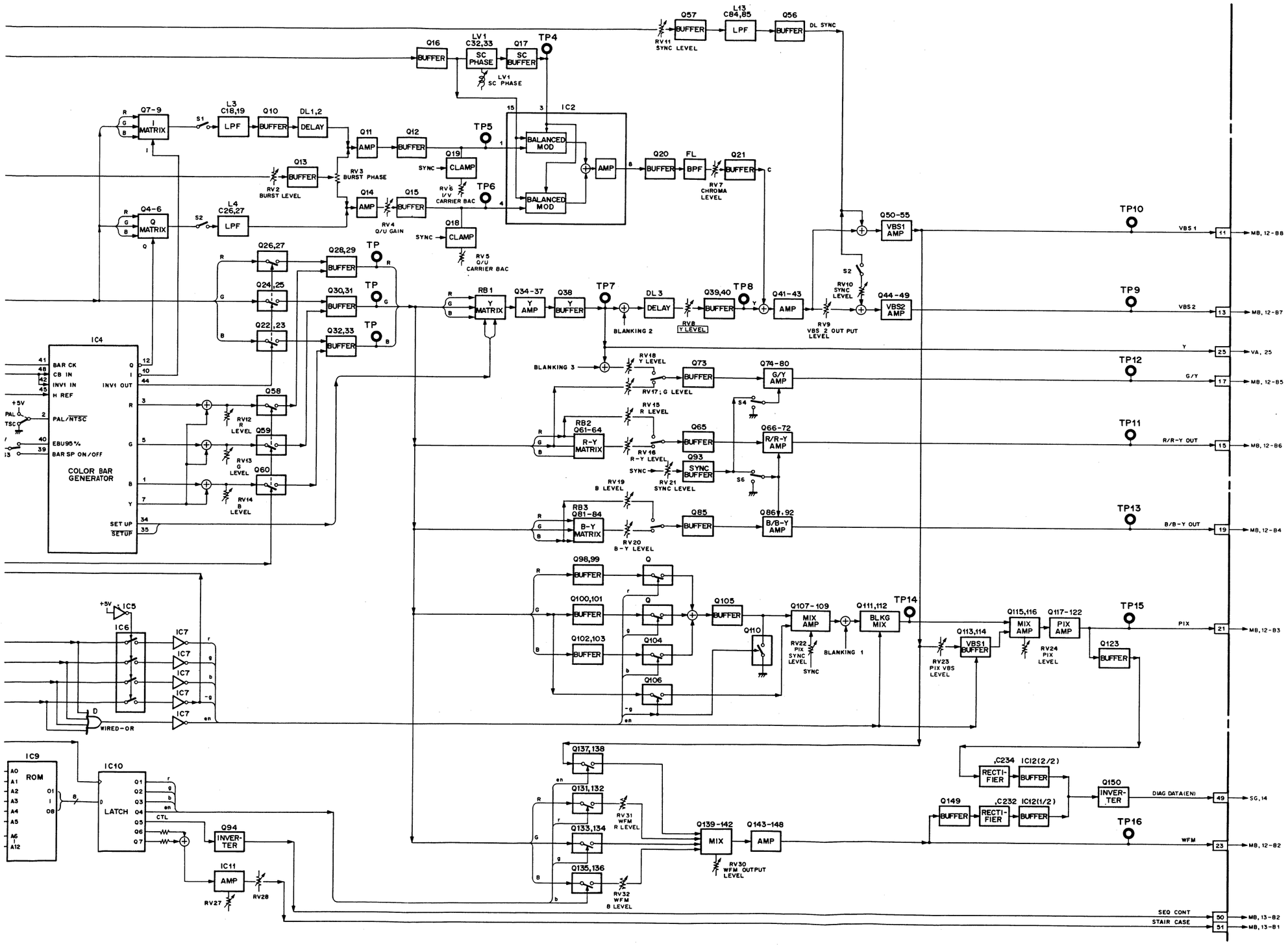
EN-64 BLOCK DIAGRAM

EN-64 BLOCK DIAGRAM



EN-64 BLOCK DIAGRAM

EN-64 BLOCK DIAGRAM

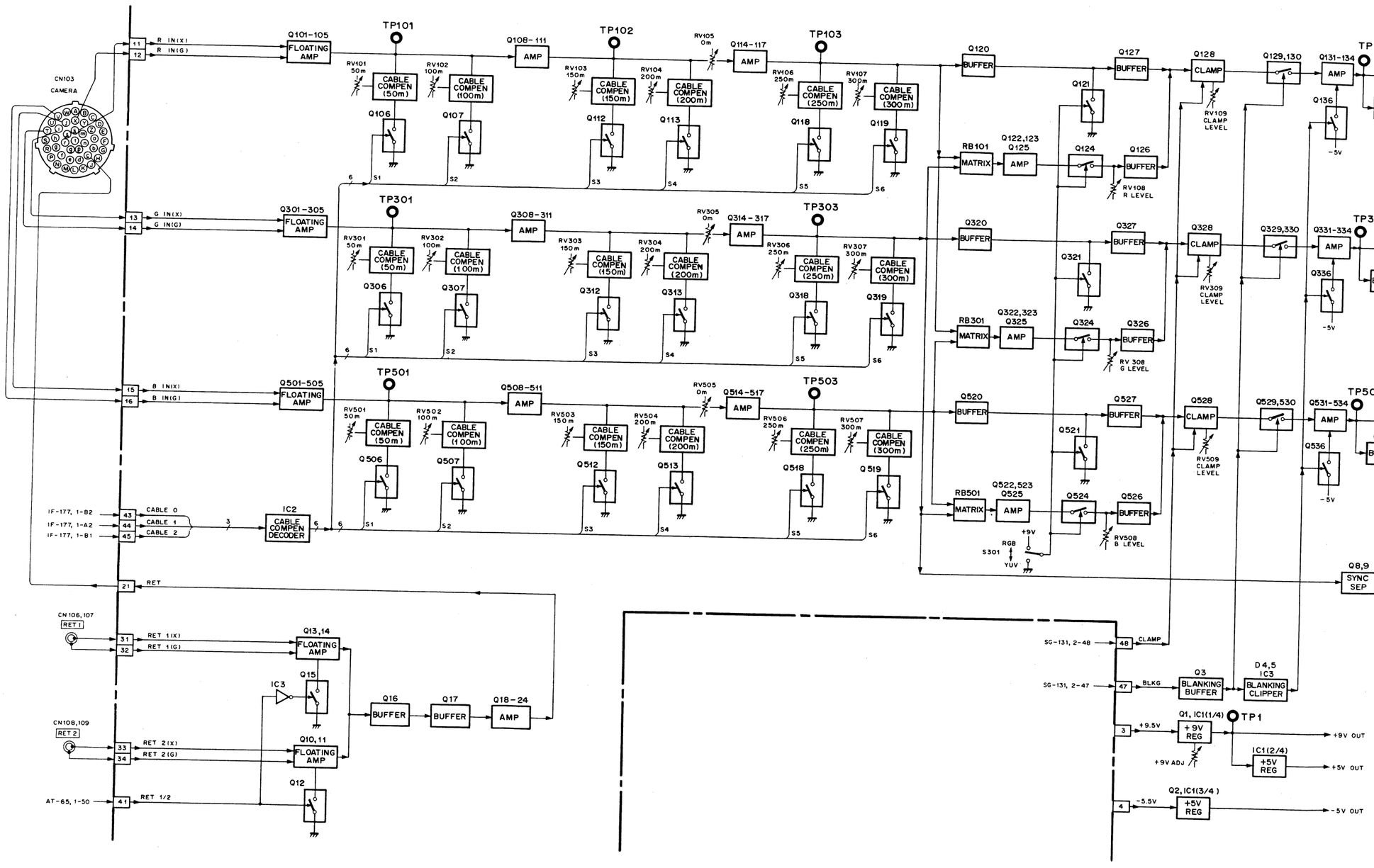


EN-64 BOARD

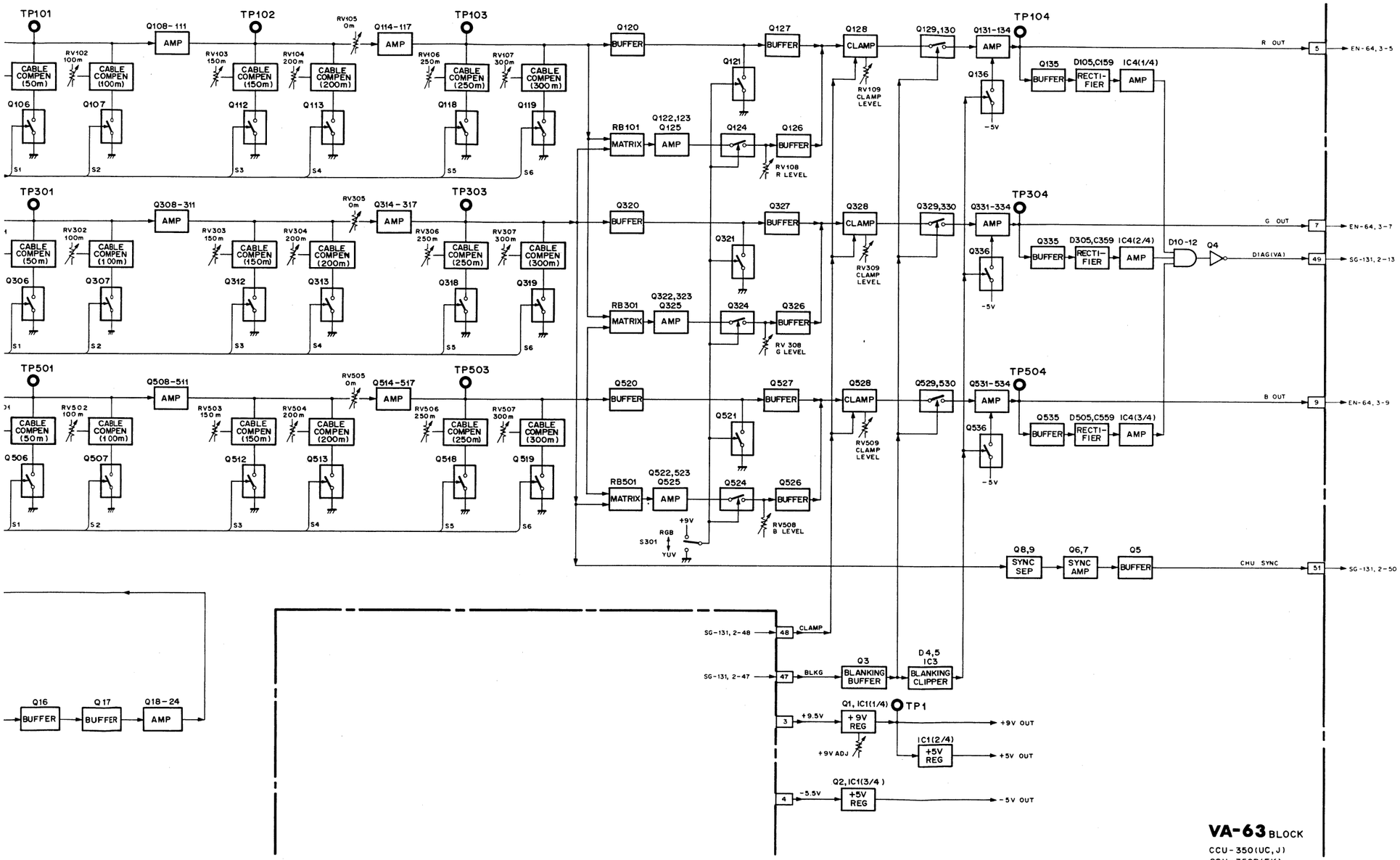
CCU-350(UC,J)
CCU-350P(EK)

VA-63 BLOCK DIAGRAM

VA-63 BLOCK DIAGRAM



VA-63 BLOCK DIAGRAM

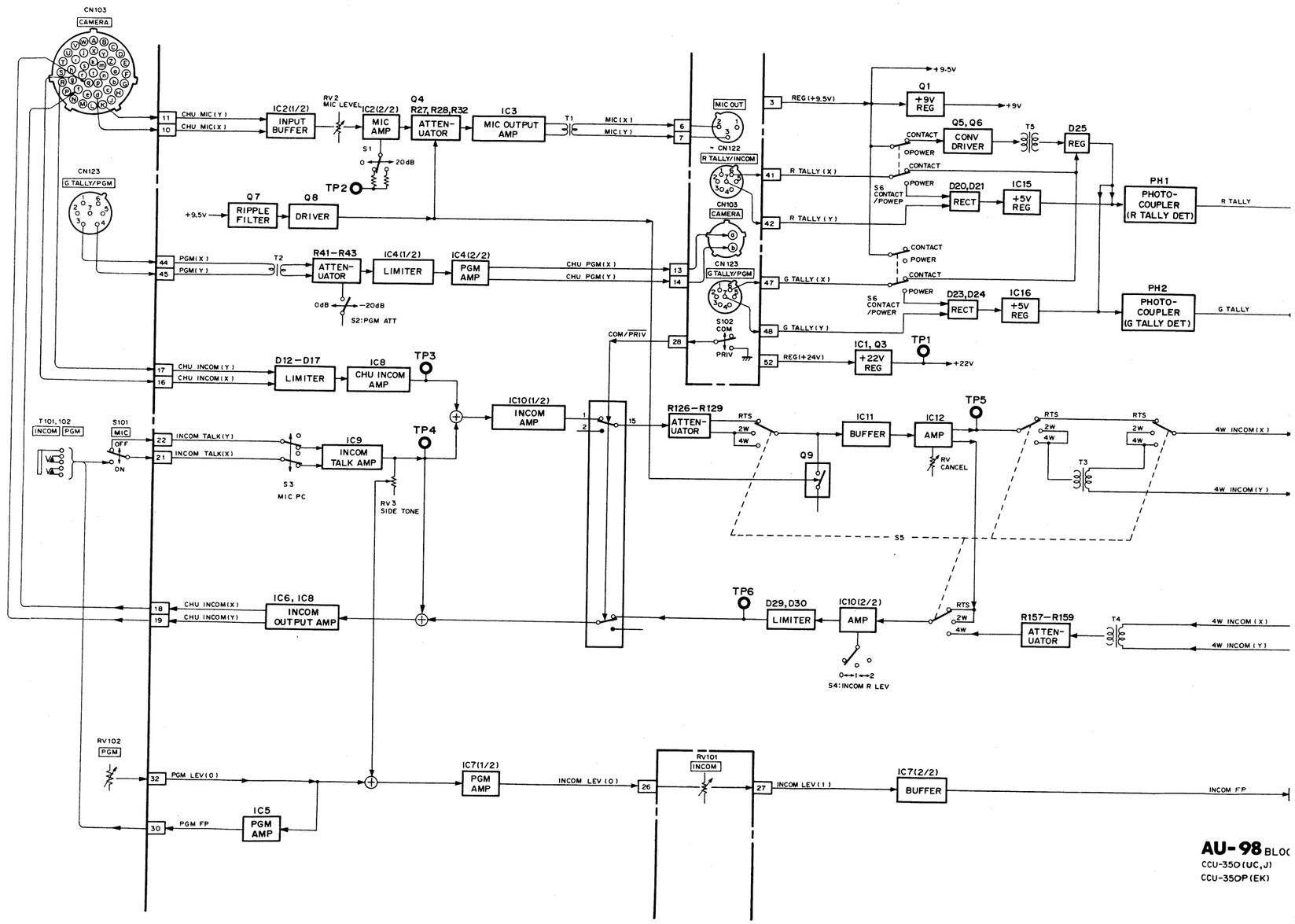


VA-63 BLOCK

CCU-350(UC,J)
CCU-350P(EK)

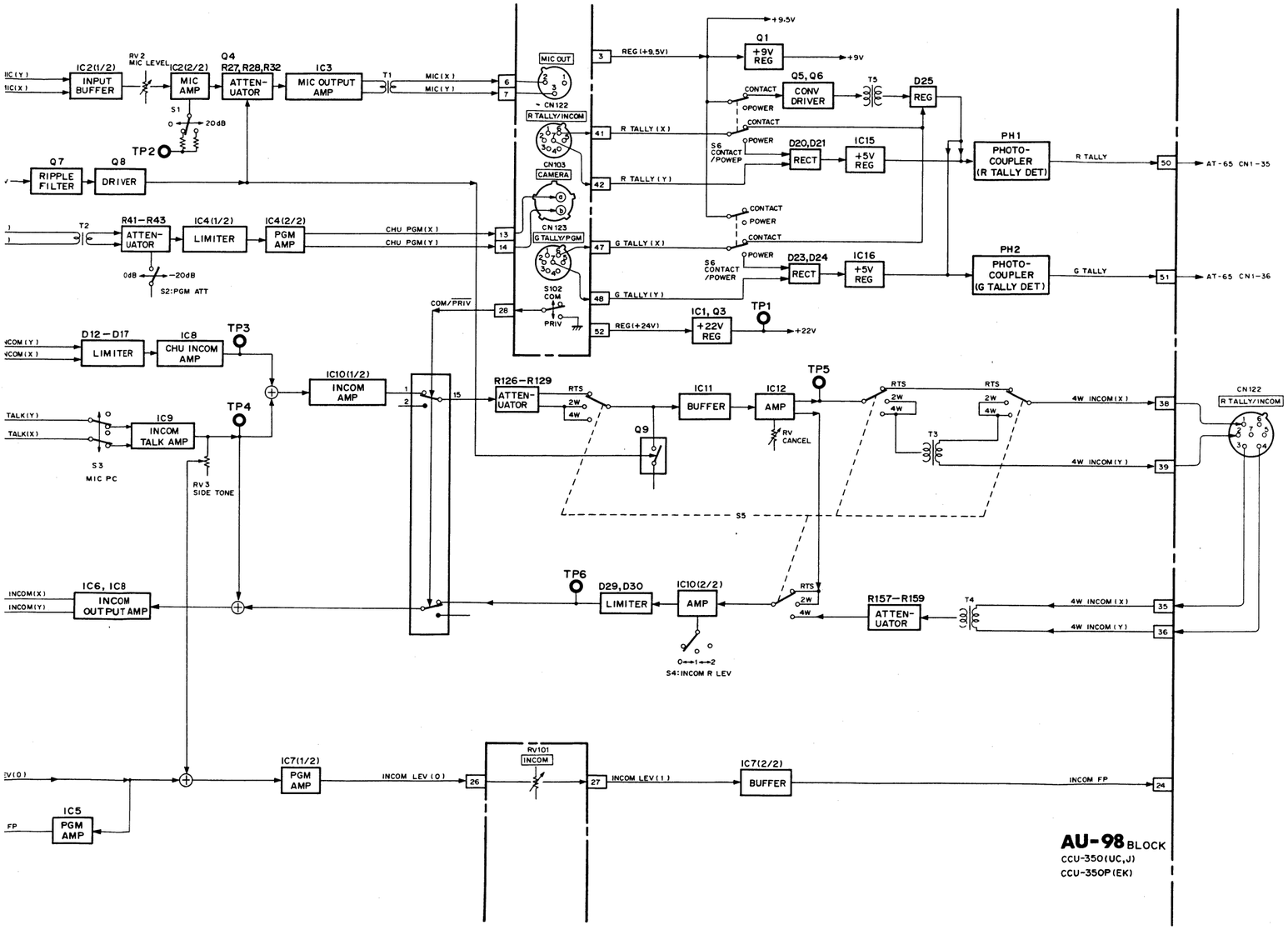
AU-98 BLOCK DIAGRAM

AU-98 BLOCK DIAGRAM AU-98 B



AU-98 BLOC
CCU-350(UC,J)
CCU-350P(EK)

AU-98 BLOCK DIAGRAM



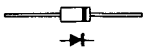
AU-98 BLOCK
CCU-350(UC,J)
CCU-350P(EK)

SECTION B
SEMICONDUCTOR

The circuit diagram of IC is obtained from the IC data book published by the manufacturer.

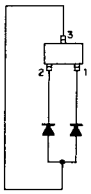
TYPE	PAGE
1S1555	B-2
2S2835	B-2
1S2837	B-2
1SS123	B-2
1SZ51	B-2
2SA1037K	B-2
2SA1122	B-2
2SA1162	B-2
2SA1179	B-2
2SA1226	B-2
2SA1385	B-2
2SA812	B-2
2SB733	B-2
2SC1009A	B-2
2SC1623	B-2
2SC2412K	B-2
2SC2712	B-2
2SC2714	B-2
2SC2812	B-2
2SC3052	B-2
2SD773	B-2
2SD774	B-2
2SK184	B-2
2SK94	B-2
3SK163	B-2
AM26LS30PC	B-3
CX22017	B-3
CX7930A	B-3
CX7968A	B-5
CX7969	B-6
CX7998	B-7
CXK58257M-10L	B-19
CXK58257AM-10L	B-19
DA204K	B-2
DAN202K	B-2
DAP202K	B-2
DTA143XK	B-19
DTC114EK	B-2
DTC143XK	B-2
ERB81-004	B-2
FC52M	B-2
GL-9HY10	B-2
HN27C64G-20	B-8
LT-9220D	B-2
MA151WA	B-2
MA151WK	B-2
MA153	B-2
MC14001BF	B-10
MC14011BF	B-10
MC14013BF	B-11
MC14014BF	B-8
MC14050BF	B-11
MC14051BF	B-11
MC14053BF	B-12
MC14070BF	B-11
MC14532BF	B-8
MSM80C154RS	B-19
MSM80C49-830RS	B-20
MSM80C49-831RS	B-20
MSM80C49-884RS	B-20
MSM80C49GS	B-8
MSM82C55A-2GS	B-20
PS2002B	B-2
PS2604	B-2
RC4556MA	B-10
RC4558M	B-10
RC78L05A	B-10
RD??E	B-2
RD??EB	B-2
RD??EB?	B-2
SN74HC00ANS	B-14
SN74HC04ANS	B-14
SN74HC153NS	B-15
SN74HC158NS	B-15
SN74HC175ANS	B-15
SN74HC32ANS	B-15
SN74HC386NS	B-20
SN74HC85NS	B-16
SN74LS123NS	B-10
SN74LS221NS	B-10
SN75176BP	B-21
SPR-54MVW	B-2
TC4016BFHB	B-11
TC4024BF	B-11
TC4028BF	B-21
TC4050BF	B-11
TC40H000F	B-12
TC40H002F	B-12
TC40H004F	B-12
TC40H008F	B-12
TC40H139F	B-12
TC40H151F	B-12
TC40H157F	B-13
TC40H163F	B-13
TC40H164F	B-13
TC40H244F	B-13
TC40H245F	B-13
TC40H373F	B-14
TC40H374F	B-14
TC5020BP	B-14
TC5517CFL-15	B-14
TC74HC221AF	B-15
TC74HC4028F	B-15
TC74HC4028AF	B-15
TC7S04F	B-21
TL062ACPS	B-16
TL064CNS	B-16
TL084CNS	B-16
TL1451CNS	B-16
TL7700CP	B-17
TL7705CPS-B	B-21
TLG123A	B-2
TLP651	B-17
TMS27C512-20JL	B-21
UPD28C64C-20	B-22
uPC311G2	B-17
uPC358G2	B-17
uPC393G2	B-17
uPC4558G2	B-10
uPC78L05A	B-17
uPD4013BG	B-17
uPD82C43G	B-18
uPD8749HD	B-18

DIODE, TRANSISTOR



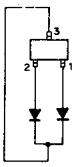
1S1555

TOP VIEW (SCALE 4/1)



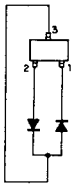
1S2835
MA151WA

TOP VIEW (SCALE 4/1)

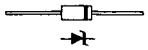


1S2837
DAN202K
MA151WK

TOP VIEW (SCALE 4/1)

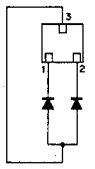


1SS123
DA204K
MA153

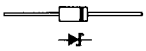


1SZ??
RD??E
RD??EB?

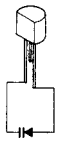
TOP VIEW (SCALE 4/1)



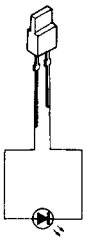
DAP202



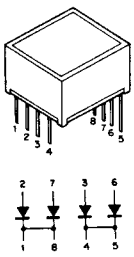
ERB81-004



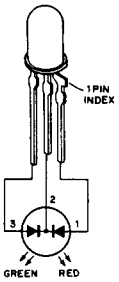
FC52M



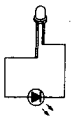
GL-9HY10; YELLOW



LT-9220D ; RED

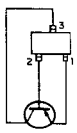


SPR-54MVW

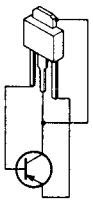


TLG123A ; GREEN

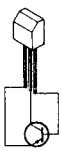
TOP VIEW (SCALE 4/1)



2SA1037K
2SA1122
2SA1162
2SA1179
2SA1226
2SA812

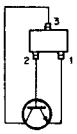


2SA1385



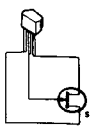
2SB733

TOP VIEW (SCALE 4/1)



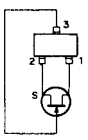
2SC1009A
2SC1623
2SC2412K
2SC2712
2SC2714
2SC2812
2SC3052

2SD773
2SD774

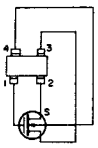


2SK184

TOP VIEW (SCALE 4/1)

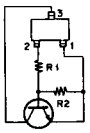


2SK94



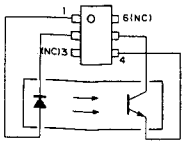
3SK163

TOP VIEW (SCALE 4/1)



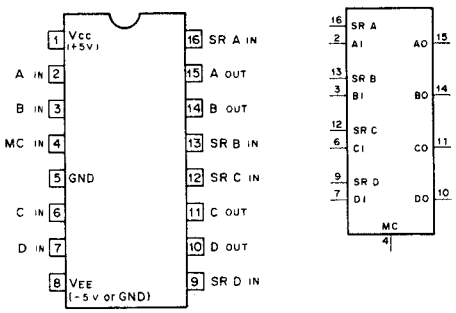
DTC114EK (R1 = 10K, R2 = 10K)
DTC143XK (R1 = 4.7K, R2 = 10K)

TOP VIEW (SCALE 2/1)



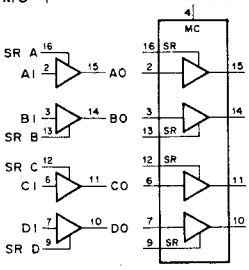
PS2002B
PS2604

AM26LS30PC (ADVANCED MICRO DEVICES)
LINE DRIVER
— TOP VIEW —



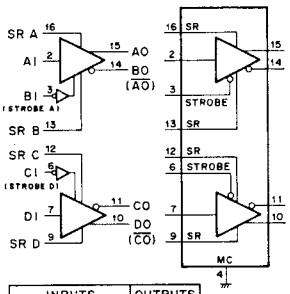
MC : MODE CONTROL
SR : SLEW RATE CONTROL

MC = 1



INPUTS		OUTPUTS
MC	A TO D	A TO D
1	0	0
1	1	1

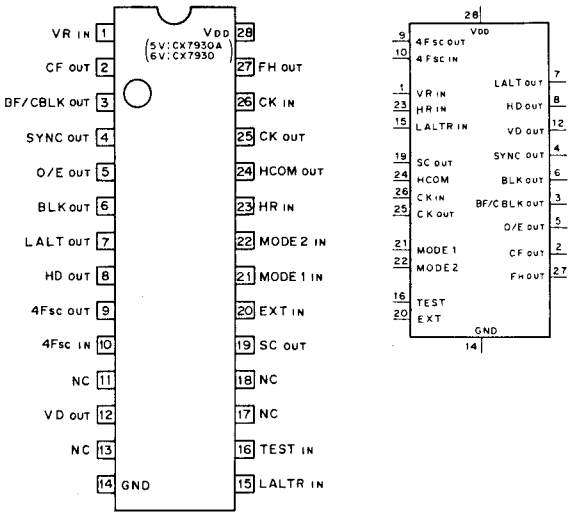
MC = 0



INPUTS			OUTPUTS	
MC	STROBE	A & D	A & D	B & C
0	0	0	0	1
0	0	1	1	0
0	1	X	HI-Z	HI-Z

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE
HI-Z ; HIGH IMPEDANCE

CX7930A (SONY) FLAT PACKAGE
C-MOS SYNC GENERATOR (NTSC, PAL-M, PAL, SECAM)
— TOP VIEW —



O/E : ODD/EVEN FIELD
CF : COLOR FRAME PULSE
HCOM : H COMPARATOR

SYSTEM	4Fsc	CLOCK
NTSC	910 FH	910FH
PAL	1135FH+2Fv	908FH
PALM	909FH	910FH
SECAM	——	908FH

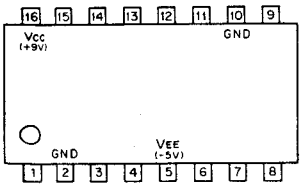
INPUTS		SYSTEM
MODE 1	MODE 2	
0	0	NTSC
0	1	SECAM
1	0	PALM
1	1	PAL

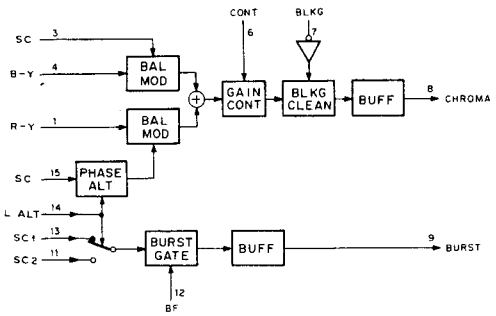
0 ; LOW LEVEL (GND)
1 ; HIGH LEVEL (VDD)

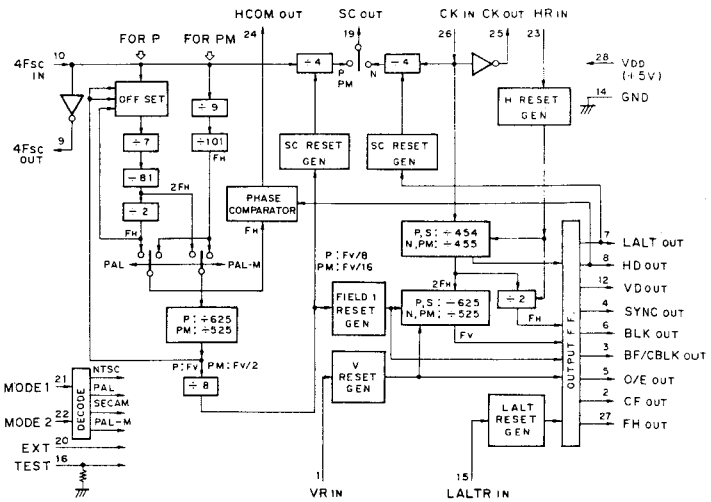
INPUTS		FUNCTION
EXT	TEST	
0	0	INTERNAL
0	1	INVALID
1	0	EXT
1	1	TEST

TEST "0" OPEN
(INTERNALLY PULLED DOWN)

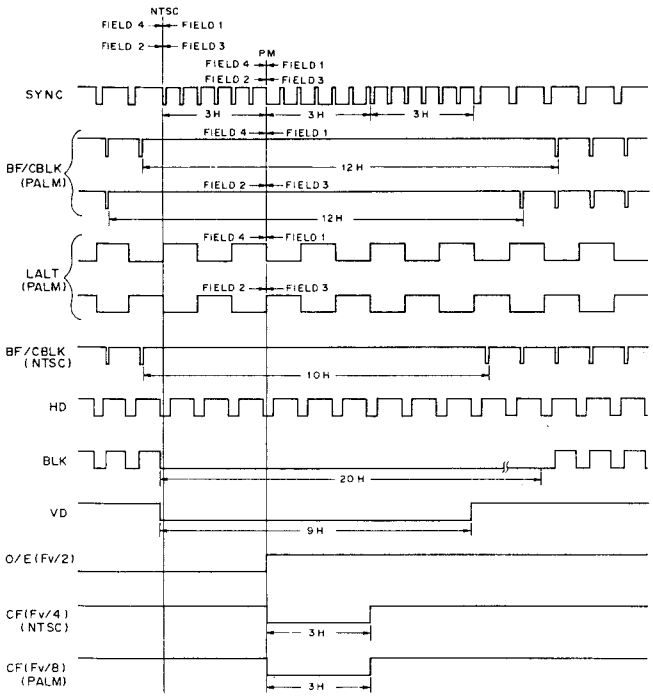
CX22017 (SONY)
VIDEO SIGNAL PROCESSOR
— TOP VIEW —



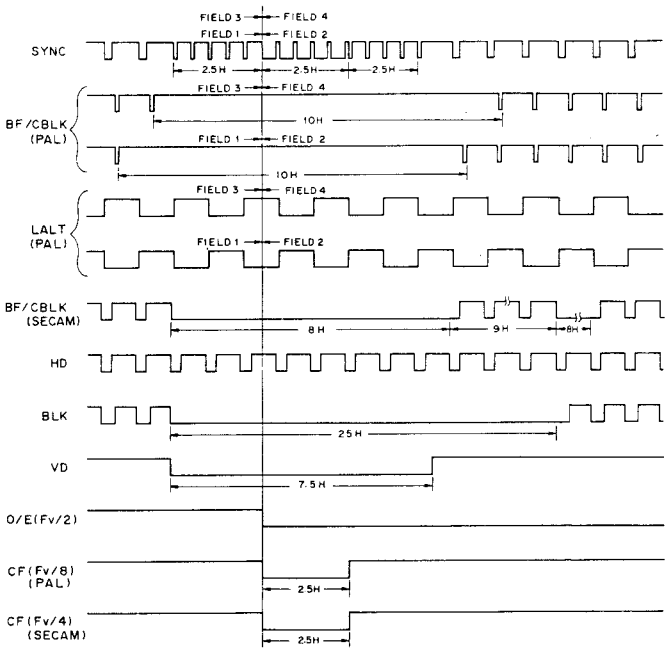




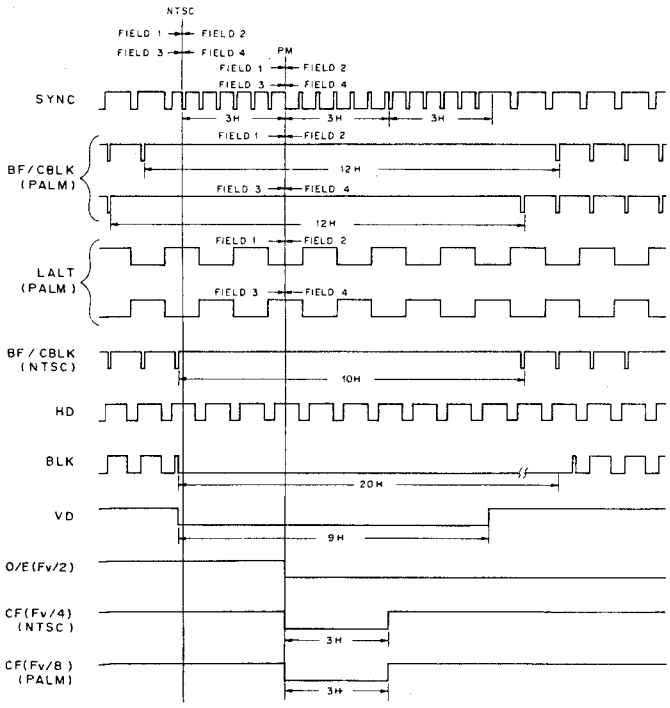
NTSC, PAL-M (FIELD 1, 3)

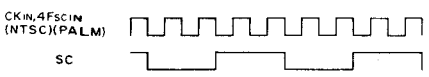


PAL, SECAM (FIELD 4, 2)

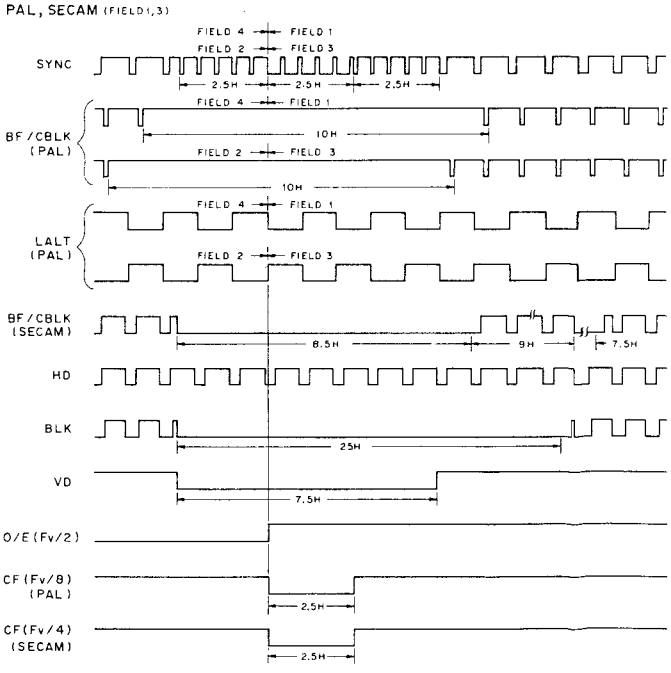


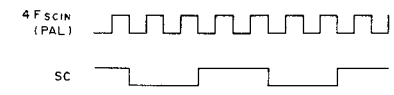
NTSC, PAL-M (FIELD 2, 4)



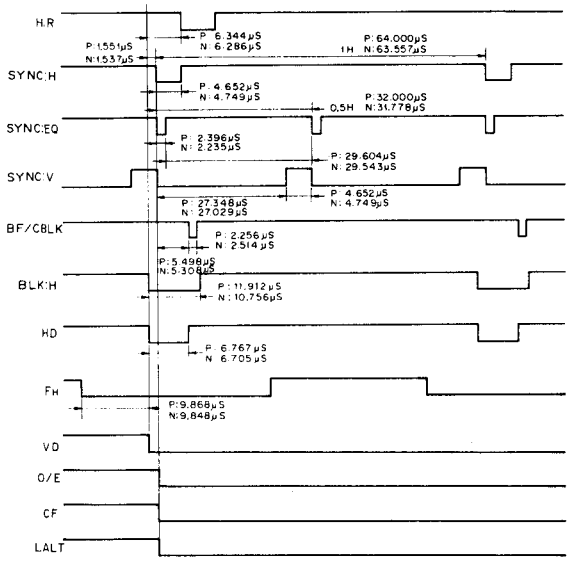


PAL, SECAM (FIELD 1, 3)





P: PAL, SECAM
N: NTSC, PALM



O COLOR BAR PATTERN

EIAJ COLOR BAR (NTSC)

GRAY	YELLOW	CYAN	GREEN	MAGENTA	RED	BLUE
−I	WHITE	+Q	BLACK			

COLOR BAR + Y BAR (PAL) or (NTSC)

WHITE	YELLOW	CYAN	GREEN	MAGENTA	RED	BLUE	BLACK
WHITE	GRAY	GRAY	GRAY	GRAY	GRAY	GRAY	BLACK

FULL FIELD COLOR BAR (NTSC)

GRAY	YELLOW	CYAN	GREEN	MAGENTA	RED	BLUE

95% COLOR BAR (PAL)

WHITE	YELLOW	CYAN	GREEN	MAGENTA	RED	BLUE	BLACK

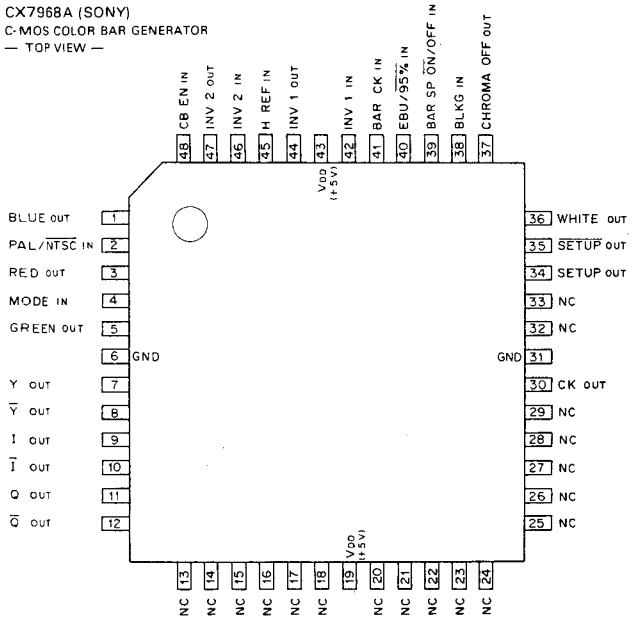
SMPTE COLOR BAR (NTSC)

GRAY	YELLOW	CYAN	GREEN	MAGENTA	RED	BLUE
BLUE	BLACK	MAGENTA	BLACK	CYAN	BLACK	GRAY
−I	WHITE	+Q	BLACK		−4 BLACK / BLACK / +4 BLACK	BLACK

EBU COLOR BAR (PAL)

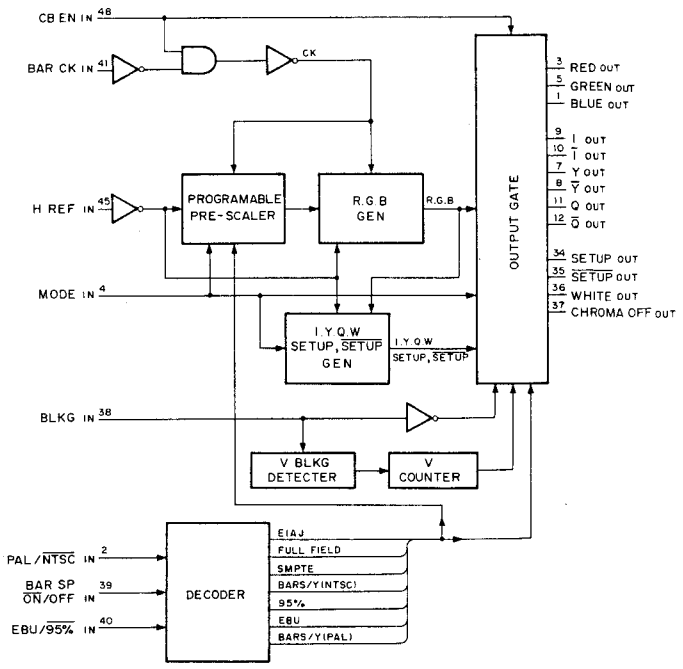
WHITE	YELLOW	CYAN	GREEN	MAGENTA	RED	BLUE	BLACK

CX7968A (SONY)
C-MOS COLOR BAR GENERATOR
— TOP VIEW —

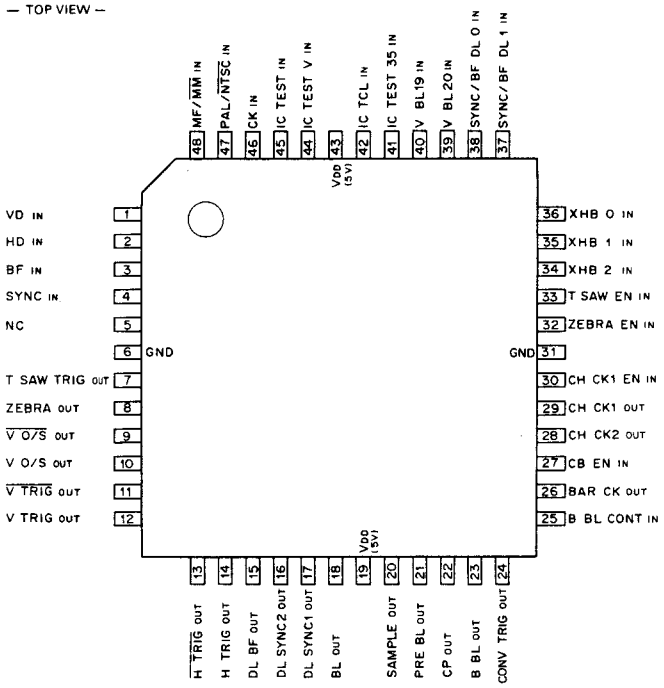


INPUT				FUNCTION
PAL/NTSC	MODE	EBU/95%	BAR SP	
0	0	0	0	EIAJ COLOR BAR
0	0	0	1	FULL FIELD COLOR BAR
0	0	1	0	INHIBIT
0	0	1	1	INHIBIT
0	1	0	0	EIAJ COLOR BAR
0	1	0	1	FULL FIELD COLOR BAR
0	1	1	0	SMPTE COLOR BAR
0	1	1	1	COLOR BAR + Y BAR
1	0	0	0	95% COLOR BAR
1	0	0	1	INHIBIT
1	0	1	0	EBU COLOR BAR
1	0	1	1	INHIBIT
1	1	0	0	95% COLOR BAR
1	1	0	1	COLOR BAR + Y BAR
1	1	1	0	EBU COLOR BAR
1	1	1	1	INHIBIT

0 ; LOW LEVEL
1 ; HIGH LEVEL



CX7969 (SONY)
C-MOS PULSE GENERATOR
— TOP VIEW —



1. SYSTEM DESIGNATION

INPUT	SYSTEM
PAL/NTSC IN	
1	PAL, SECAM
0	NTSC, PALM

2. TYPE OF TUBE

INPUT	FUNCTION
MF/MM IN	
1	MAG-STA TUBE
0	MAG-MAG TUBE

3. V BLKG WIDTH (NTSC ONLY)

INPUT		V BLKG WIDTH
V BL 19	V BL 20	
1	X	19H
0	1	20H
0	0	21H

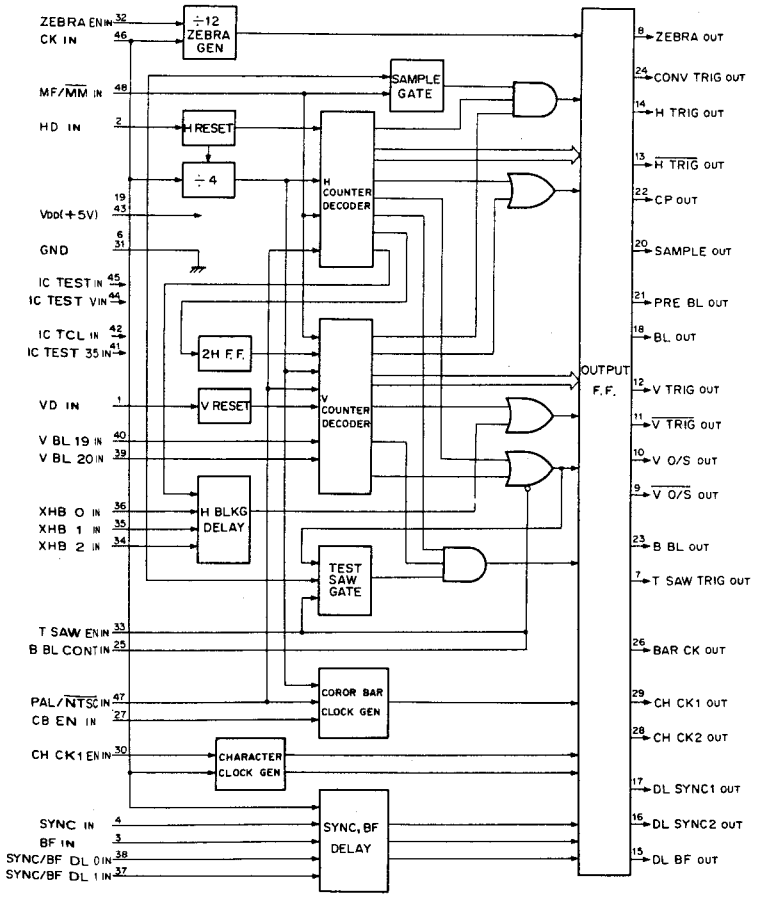
4. H BLKG WIDTH

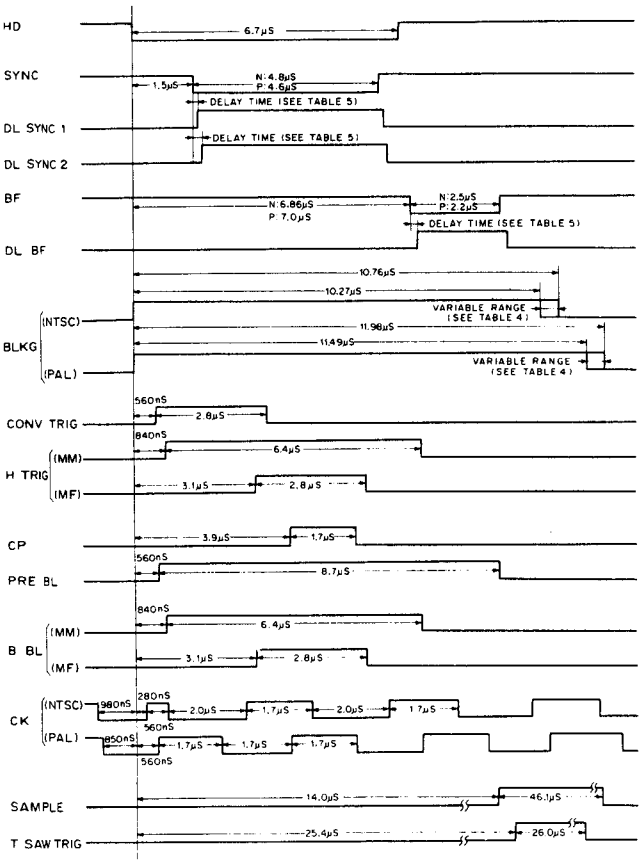
INPUT			BLKG WIDTH (μS)	
XHB2	XHB1	XHB0	NTSC	PAL
1	1	1	10.27	11.49
1	1	0	10.34	11.56
1	0	1	10.41	11.63
1	0	0	10.48	11.70
0	1	1	10.55	11.77
0	1	0	10.62	11.84
0	0	1	10.69	11.91
0	0	0	10.76	11.98

5. DELAY TIME

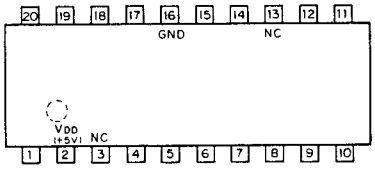
INPUT		DELAY TIME (nS)		
SYNC/BF DL1	SYNC/BF DL2	DL SYNC 1	DL SYNC 2	DL BF
1	1	140	210	140
1	0	210	280	210
0	1	630	700	630
0	0	700	770	700

1; HIGH LEVEL
0; LOW LEVEL
X; DON'T CARE



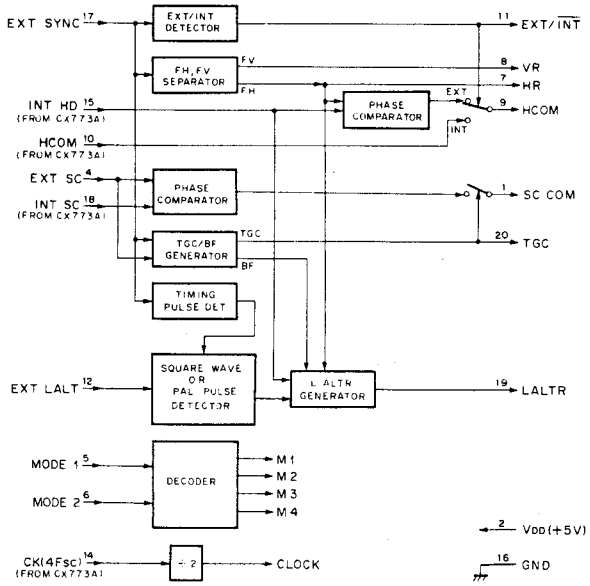


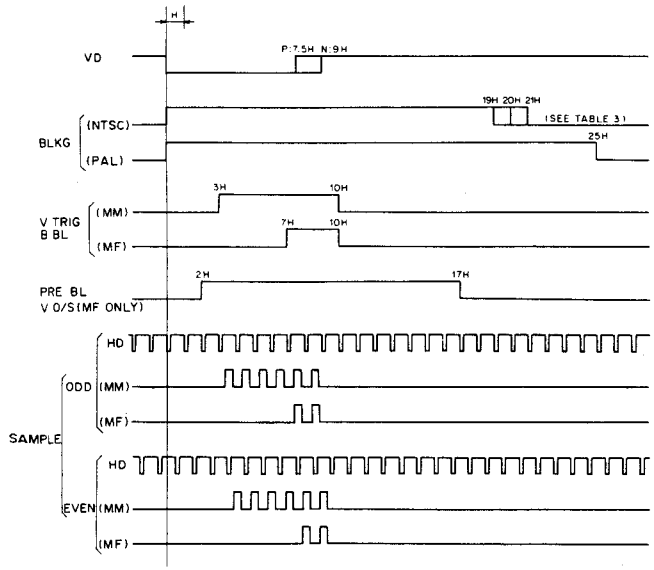
CX7998 (SONY) FLAT PACKAGE
C-MOS GENLOCK DRIVER FOR CX773A
— TOP VIEW —



INPUTS		EXT LOCK MODE	
MODE 1	MODE 2		
0	0	M 1	PAL:VBS
1	0	M 2	PAL-M:VBS
0	1	M 3	PAL:VS/SC/LALT
			SECAM:VS/SC/LALT
1	1	M 4	NTSC:VBS
			NTSC:VS/SC
			PAL-M:VS/SC/LALT

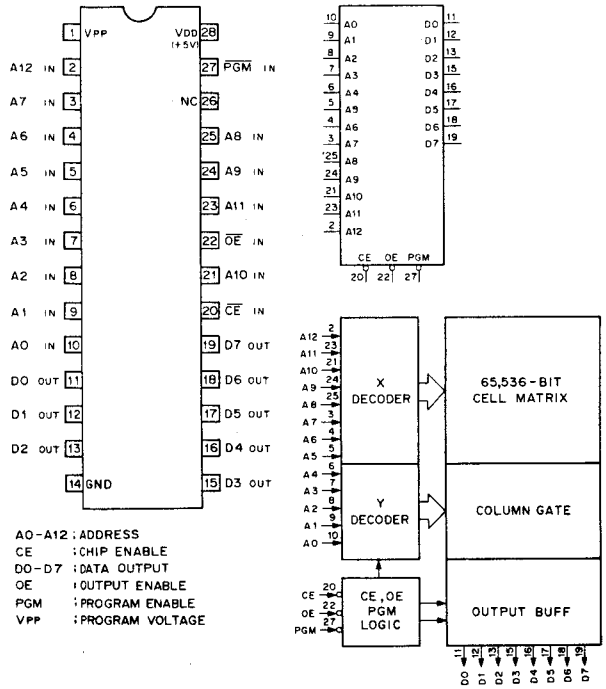
0; LOW LEVEL
1; HIGH LEVEL





HN27C64G-20 (HITACHI) (ACCESS TIME = 200nS)
27C64-25-C35CRM (NEC)

C-MOS 64K (8K-8) ERASABLE PROM WITH 3-STATE OUTPUTS
– TOP VIEW –

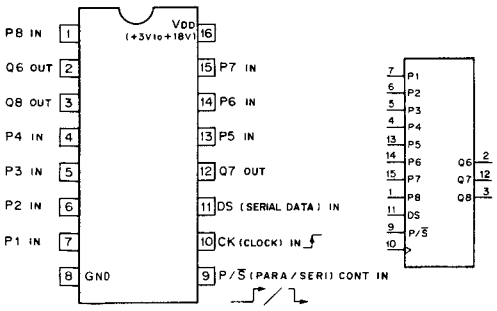


A0–A12 : ADDRESS
CE : CHIP ENABLE
DO–D7 : DATA OUTPUT
OE : OUTPUT ENABLE
PGM : PROGRAM ENABLE
VPP : PROGRAM VOLTAGE

An	CE	OE	PGM	VPP	Dn	FUNCTION
An	0	0	1	+5V	D OUT	READ
An	0	1	1	+5V	HI-Z	OUTPUT DISABLE
An	0	0	0	+5V	HI-Z	OUTPUT DISABLE
X	1	X	X	+5V	HI-Z	STANDBY
An	0	X	⎍	+21V	DIN	PGM
An	0	0	1	+21V	D OUT	PGM VERIFY
X	1	X	X	+21V	HI-Z	PGM INH

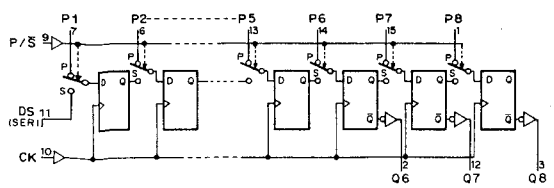
0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE
HI-Z ; HIGH IMPEDANCE

MC14014BF (MOTOROLA) FLAT PACKAGE
C-MOS SYNCHRONOUS SERIAL/PARALLEL 8-BIT STATIC SHIFT REGISTER
– TOP VIEW –

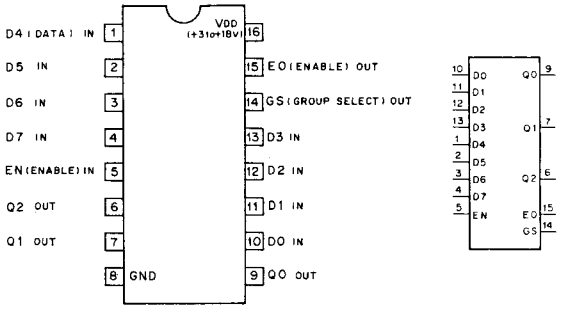


tn					tn+1							
INPUTS					INTERNAL OUTPUTS					OUTPUTS		
P/S CONT	CK	P	DS		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
1	⎍	P1~P8	X		P1	P2	P3	P4	P5	P6	P7	P8
0	⎍	X	1		1	Q1n	Q2n	Q3n	Q4n	Q5n	Q6n	Q7n
0	⎍	X	0		0	Q1n	Q2n	Q3n	Q4n	Q5n	Q6n	Q7n
X	0	X	X		Q1n	Q2n	Q3n	Q4n	Q5n	Q6n	Q7n	Q8n

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE.
tn ; BEFORE CLOCK
tn+1 ; AFTER CLOCK



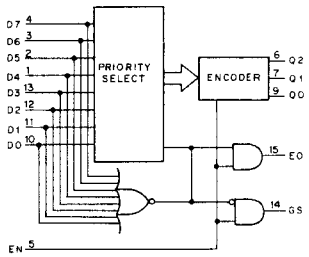
MC14532BF (MOTOROLA) FLAT PACKAGE
C-MOS 8-BIT PRIORITY ENCODER
– TOP VIEW –



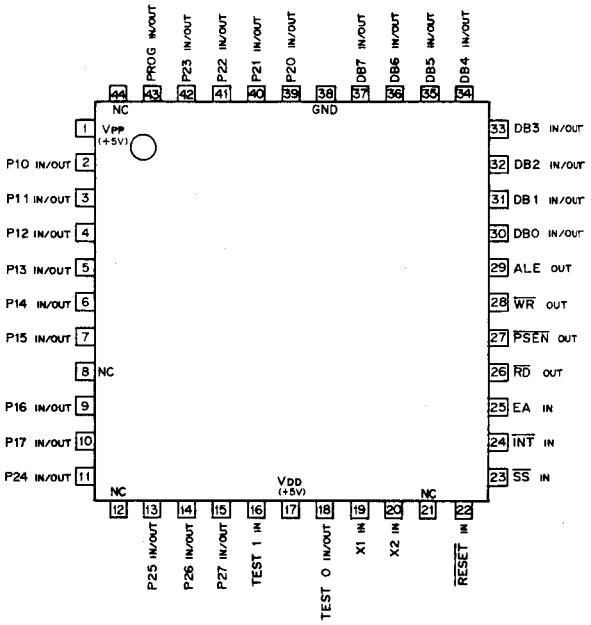
D7 IS THE HIGHEST PRIORITY

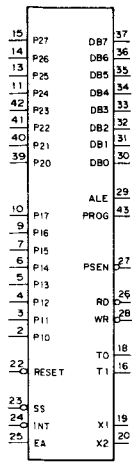
INPUTS									OUTPUTS				
EN	D7	D6	D5	D4	D3	D2	D1	D0	GS	Q2	Q1	Q0	EO
0	X	X	X	X	X	X	X	X	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	1
1	1	X	X	X	X	X	X	X	1	1	1	1	0
1	0	1	X	X	X	X	X	X	1	1	1	0	0
1	0	0	1	X	X	X	X	X	1	1	0	1	0
1	0	0	0	1	X	X	X	X	1	1	0	0	0
1	0	0	0	0	1	X	X	X	1	0	1	1	0
1	0	0	0	0	0	1	X	X	1	0	1	0	0
1	0	0	0	0	0	0	1	X	1	0	0	1	0
1	0	0	0	0	0	0	0	1	1	0	0	0	0

1 : HIGH LEVEL
0 : LOW LEVEL
X : DON'T CARE

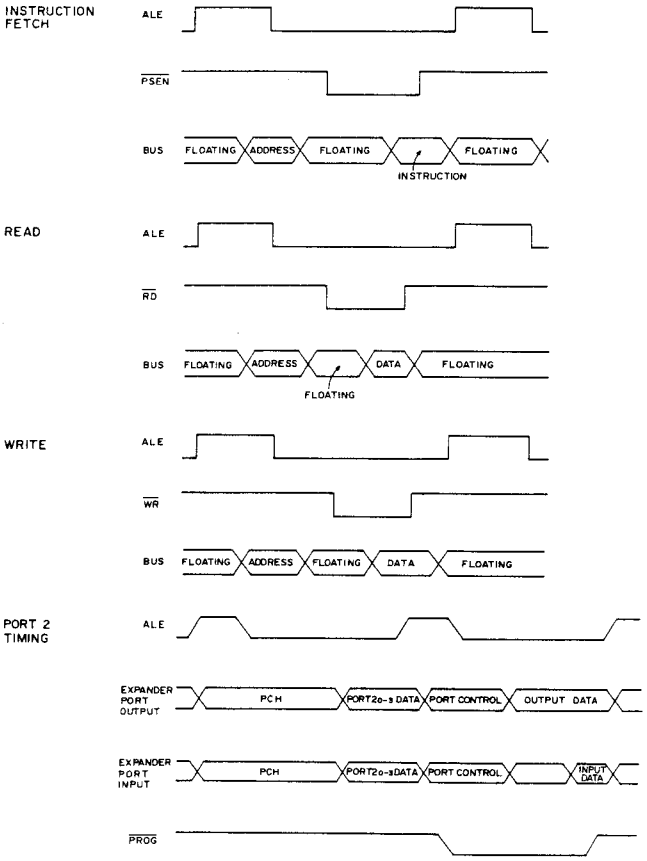


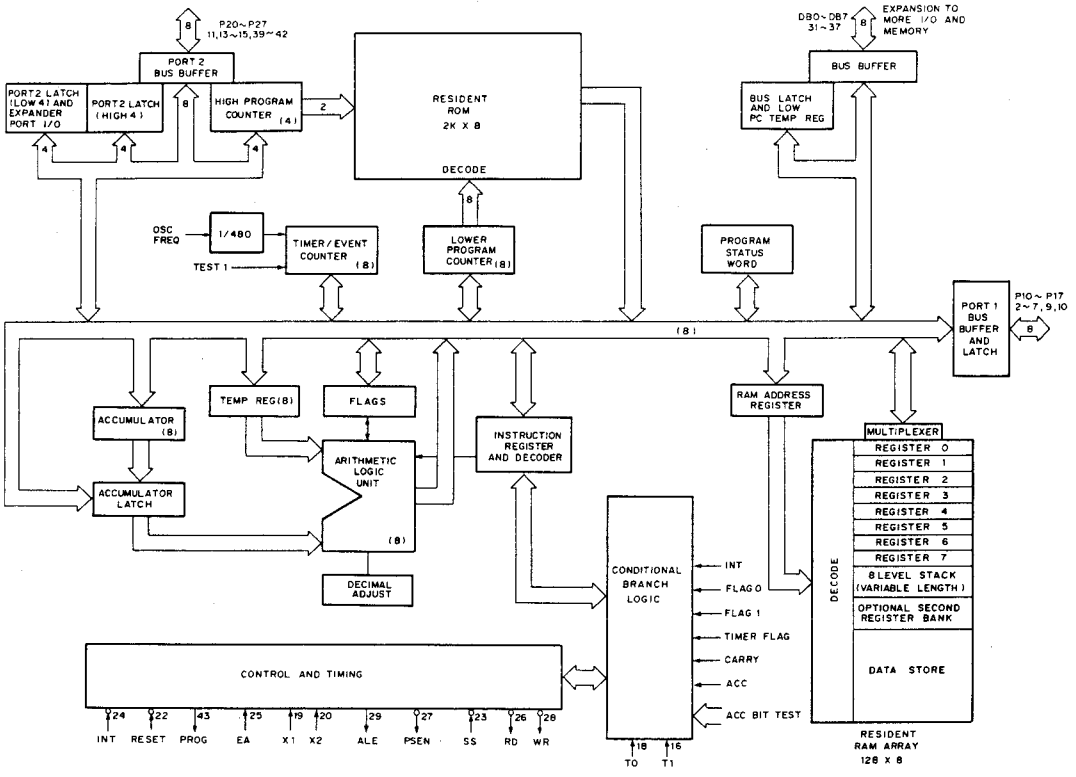
MSM80C49GS (OKI) FLAT PACKAGE
C-MOS 8-BIT MICROPROCESSOR
– TOP VIEW –



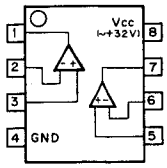


ALE	; ADDRESS LATCH ENABLE
DB0-7	; DATA BUS
EA	; EXTERNAL ACCESS
$\overline{INT}$	; INTERRUPT
P20-27	; I/O PORT 2
P10-17	; I/O PORT 1
PROG	; PROGRAM PULSE
$\overline{PSEN}$	; PROGRAM STORE ENABLE
$\overline{RD}$	; READ
$\overline{RESET}$	; INITIALIZING IN
$\overline{SS}$	; SINGLE STEP
TO	; TEST 0 I/O
T1	; TEST 1 IN
Vcc	; +5V
VDD	; +5V FOR INTERNAL DATA MEMORY
$\overline{WR}$	; WRITE
X1,X2	; GRYSTAL OSC

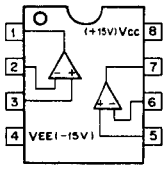




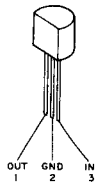
NJM4556M-A (JRC) FLAT PACKAGE
RC4556MA (RAYTHEON) FLAT PACKAGE
OPERATIONAL AMPLIFIER
— TOP VIEW —

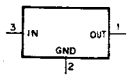


RC4558M (RAYTHEON) FLAT PACKAGE
UPC4558G2 (NEC) FLAT PACKAGE
DUAL OPERATIONAL AMPLIFIER
– TOP VIEW –

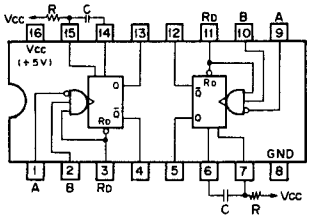


RC78L05A (RAYTHEON) + 5V
POSITIVE VOLTAGE REGULATOR (100mA)





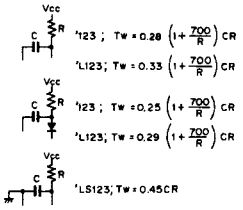
SN74LS123NS (TI) FLAT PACKAGE
TTL RETRIGGERABLE MONOSTABLE MULTIVIBRATOR WITH DIRECT RESET
— TOP VIEW —



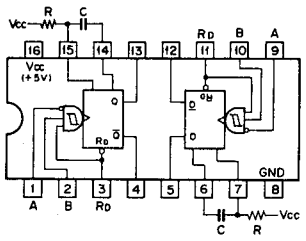
INPUTS			OUTPUTS	
Rd	A	B	Q	$\bar{Q}$
0	X	X	0	1
X	1	X	0	1
X	X	0	0	1
1	0	↑	⊓	⊔
1	↓	1	⊓	⊔
↑	0	1	⊓	⊔

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE

OUTPUT PULSE WIDTH



SN74LS221NS (TI) FLAT PACKAGE
TTL MONOSTABLE MULTIVIBRATOR WITH SCHMITT TRIGGER INPUT
— TOP VIEW —

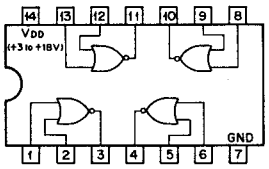


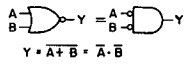
INPUTS			OUTPUTS	
Rd	A	B	Q	$\bar{Q}$
0	X	X	0	1
X	1	X	0	1
X	X	0	0	1
1	0	↑	⊓	⊔
1	↓	1	⊓	⊔
↑	0	1	⊓	⊔

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE

OUTPUT PULSE WIDTH = 0.7CR

MC14001BF (MOTOROLA) FLAT PACKAGE
TC4001BF (TOSHIBA) FLAT PACKAGE
C-MOS 2-INPUT NOR GATE
– TOP VIEW –

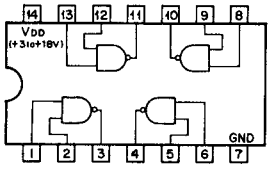


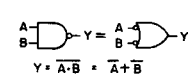


A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

0; LOW LEVEL
1; HIGH LEVEL

MC14011BF (MOTOROLA) FLAT PACKAGE
C-MOS 2-INPUT NAND GATE
– TOP VIEW –

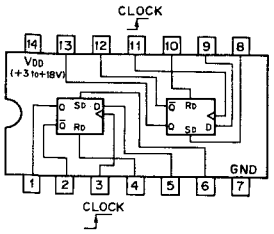




A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

0:LOW LEVEL
1:HIGH LEVEL

MC14013BF (MOTOROLA) FLAT PACKAGE
C-MOS D-TYPE FLIP FLOP WITH DIRECT SET/RESET
– TOP VIEW –

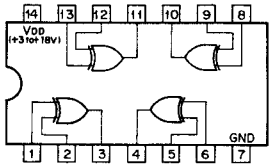


DIRECT R-S FLIP FLOP			
Sd	Rd	Q	$\bar{Q}$
0	0	Qn	$\bar{Q}n$
0	1	0	1
1	0	1	0
1	1	0	1

D-TYPE FLIP FLOP	
CKn	CKn+1
D	Q
0	0
1	1

CLOCK CK; ⌐¬
CKn; BEFORE CLOCK
CKn+1; AFTER CLOCK
0; LOW LEVEL
1; HIGH LEVEL

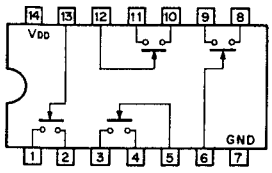
MC14070BF (MOTOROLA) FLAT PACKAGE
C-MOS QUAR. EXCLUSIVE OR GATES
– TOP VIEW –



A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

0; LOW LEVEL
1; HIGH LEVEL

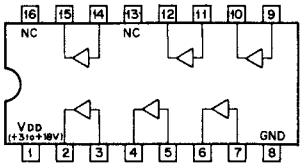
TC4016BFHB (TOSHIBA) FLAT PACKAGE
C-MOS BILATERAL SWITCH
— TOP VIEW —

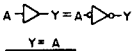


CONT IN	SW
0	OFF
1	ON

0; LOW LEVEL
1; HIGH LEVEL

MC14050BF (MOTOROLA) FLAT PACKAGE
TC4050BF (TOSHIBA) FLAT PACKAGE
C-MOS NON-INVERTING TYPE BUFFER/CONVERTER
– TOP VIEW –

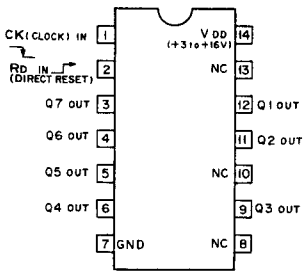


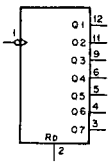


A	Y
0	0
1	1

0 ; LOW LEVEL
1 ; HIGH LEVEL

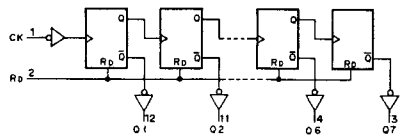
TC4024BF (TOSHIBA) FLAT PACKAGE
C-MOS ASYNCHRONOUS 7-BIT BINARY COUNTER
— TOP VIEW —



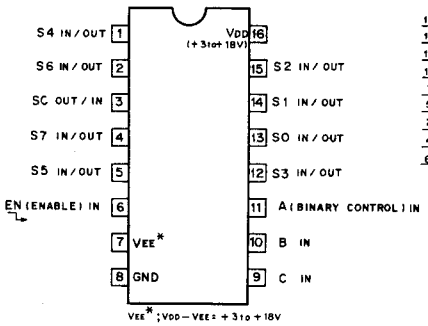


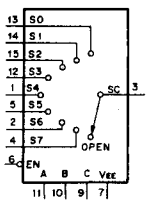
COUNT	INPUTS		OUTPUTS							
	CK	Rd	Q7	Q6	Q5	Q4	Q3	Q2	Q1
0	X	1	0	0	0	0	0	0	0
1	↓	0	0	0	0	0	0	0	1
2	↓	0	0	0	0	0	0	1	0
3	↓	0	0	0	0	0	0	1	1
4	↓	0	0	0	0	0	1	0	0
125	↓	0	1	1	1	1	1	0	1
126	↓	0	1	1	1	1	1	1	0
127	↓	0	1	1	1	1	1	1	1
—	0	0	NO CHANGE						
—	1	0							

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE



MC14051BF (MOTOROLA) FLAT PACKAGE
C-MOS 8-CHANNEL MULTIPLEXER/DEMULTIPLEXER
– TOP VIEW –



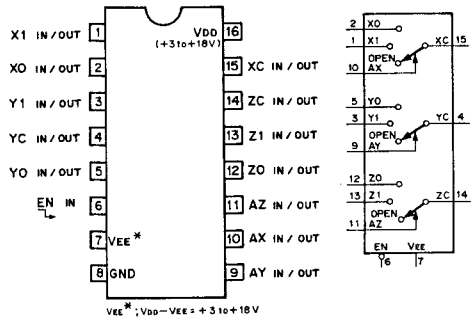


EN	C	B	A	"ON" CHANNEL
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	X	X	X	OPEN

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE

MC14053BF (MOTOROLA) FLAT PACKAGE
TC4053BFHB (TOSHIBA) FLAT PACKAGE

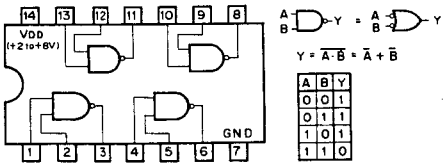
C-MOS TRIPLE 2-CHANNEL ANALOG MULTIPLEXER/DEMULTIPLEXER
— TOP VIEW —


X1 IN / OUT 1
XO IN / OUT 2
Y1 IN / OUT 3
YC IN / OUT 4
YO IN / OUT 5
EN IN 6
VEE * 7
GND 8
VDD (+3 to +18V) 16
XC IN / OUT 15
ZC IN / OUT 14
Z1 IN / OUT 13
ZO IN / OUT 12
AZ IN / OUT 11
AX IN / OUT 10
AY IN / OUT 9
OPEN AX
OPEN AY
OPEN AZ
VEE * ; VDD − VEE = +3 to +18 V

CONT. INPUTS		ON
EN	A (X,Y,Z)	CHANNEL
0	0	0
0	1	1
1	X	OPEN

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE.

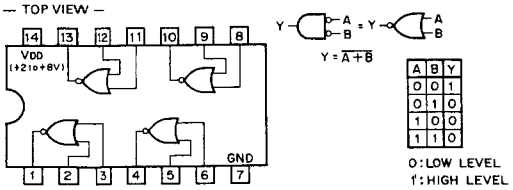
TC40H000F (TOSHIBA) FLAT PACKAGE
C-MOS 2-INPUT NAND GATE
— TOP VIEW —



A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

0; LOW LEVEL
1; HIGH LEVEL

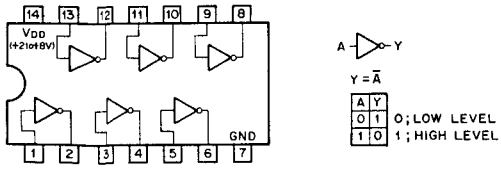
TC40H002F (TOSHIBA) FLAT PACKAGE
C-MOS 2-INPUT NOR GATE
— TOP VIEW —



A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

0 : LOW LEVEL
1 : HIGH LEVEL

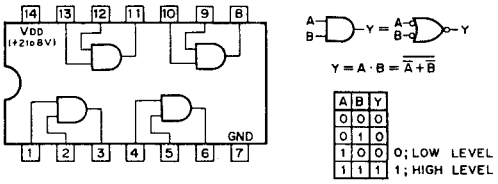
TC40H004F (TOSHIBA) FLAT PACKAGE
C-MOS INVERTER
— TOP VIEW —



A	Y
0	1
1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL

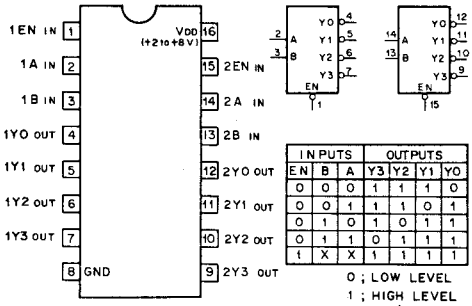
TC40H008F (TOSHIBA) FLAT PACKAGE
C-MOS 2-INPUT POSITIVE-AND GATE
— TOP VIEW —



A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

0 ; LOW LEVEL
1 ; HIGH LEVEL

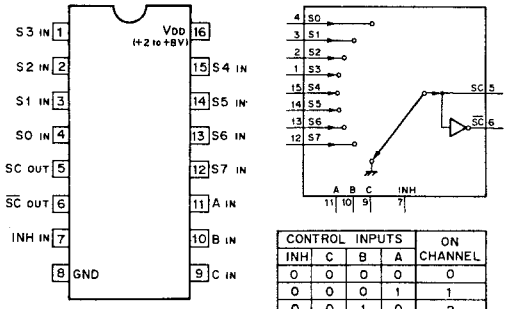
TC40H139F (TOSHIBA) FLAT PACKAGE
C-MOS 2-TO-4-LINE DECODER/DEMULTIPLXER
— TOP VIEW —



INPUTS			OUTPUTS			
EN	B	A	Y3	Y2	Y1	YO
0	0	0	1	1	1	0
0	0	1	1	1	0	1
0	1	0	1	0	1	1
0	1	1	0	1	1	1
1	X	X	1	1	1	1

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

TC40H151F (TOSHIBA) FLAT PACKAGE
C-MOS 8-LINE-TO-1-LINE DATA SELECTOR/MULTIPLEXER
— TOP VIEW —



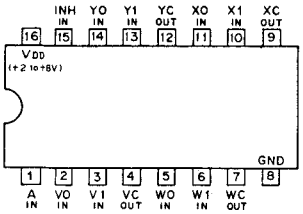
CONTROL INPUTS				ON
INH	C	B	A	CHANNEL
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	X	X	X	GND

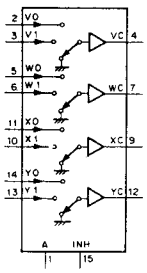
0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

TC40H157F (TOSHIBA) FLAT PACKAGE

C-MOS 2-LINE-TO-1-LINE DATA SELECTOR/MULTIPLEXER

— TOP VIEW —





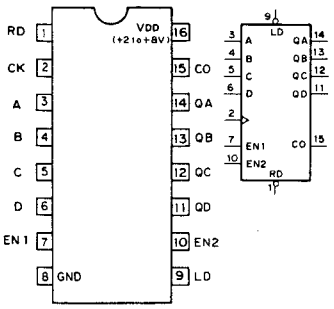
CONT. IN		ON CHANNEL
INH	A	
0	0	0
0	1	1
1	X	GND

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

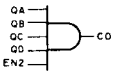
TC40H163F (TOSHIBA) FLAT PACKAGE

C-MOS PRESETTABLE SYNCHRONOUS 4-BIT BINARY COUNTER

— TOP VIEW —



CARRY OUTPUT "CO"



CO GOES HIGH WHEN EN2 IS HIGH AND COUNT IS "15".

MODE SELECTION

CONT. INPUTS				MODE
RD	LD	EN1	EN2	
0	X	X	X	RESET (SYNCHRONOUS)
1	0	X	X	PRESET (SYNCHRONOUS)
1	1	0	X	NO COUNT
1	1	X	0	NO COUNT
1	1	1	1	COUNT

COUNT SEQUENCE

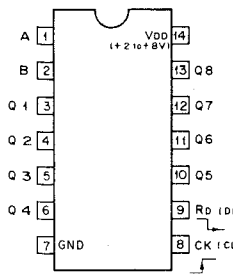
COUNT	OUTPUTS			
	QD	QC	QB	QA
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
⋮	⋮	⋮	⋮	⋮
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

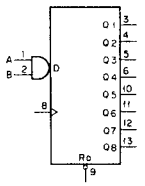
0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

TC40H164F (TOSHIBA) FLAT PACKAGE

C-MOS 8-BIT PARALLEL-OUT SERIAL SHIFT REGISTER

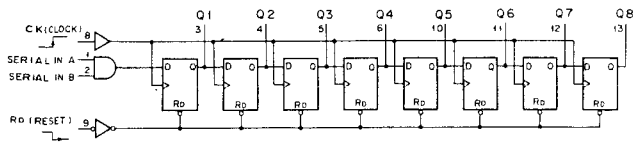
— TOP VIEW —





INPUTS				OUTPUTS			
RD	CK	A	B	Q1	Q2	----	Q8
0	X	X	X	0	0	0	0
1	0	X	X	Q1o	Q2o	----	Q8o
1	↑	1	1	1	Q1n	----	Q7n
1	↑	0	X	0	Q1n	----	Q7n
1	↑	X	0	0	Q1n	----	Q7n

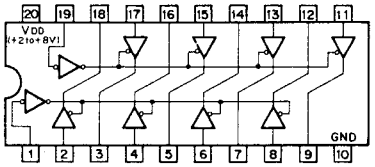
0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE.



TC40H244F (TOSHIBA) FLAT PACKAGE

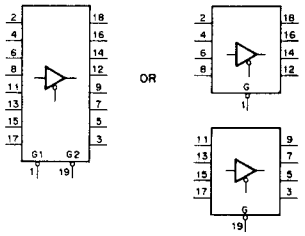
C-MOS 3-STATE BUFFER/DRIVER

— TOP VIEW —



G	A	Y
0	0	0
0	1	1
1	X	HI-Z

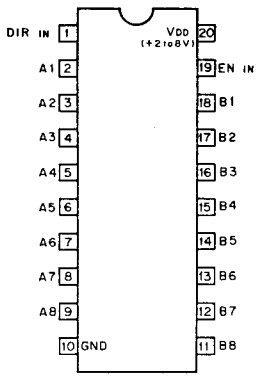
0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE
HI-Z ; HIGH IMPEDANCE



TC40H245F (TOSHIBA) FLAT PACKAGE

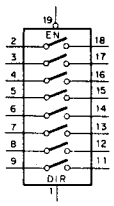
C-MOS BILATERAL BUS TRANSCEIVERS WITH 3-STATE OUTPUT

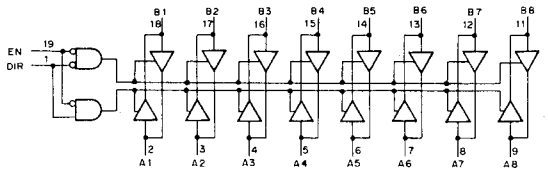
— TOP VIEW —



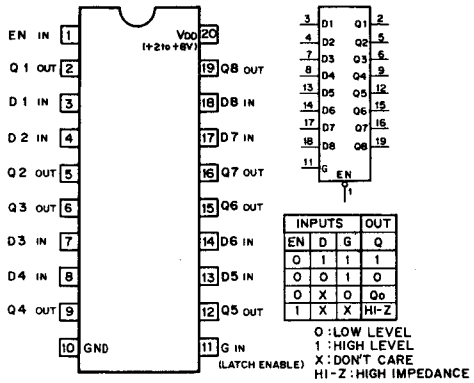
EN	DIR	OPERATION
0	0	B to A
0	1	A to B
1	X	HI-Z

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE.



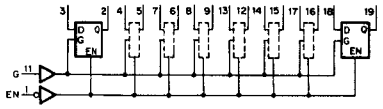


TC40H373F (TOSHIBA) FLAT PACKAGE
C-MOS 3-STATE OUTPUTS OCTAL LATCHES
— TOP VIEW —

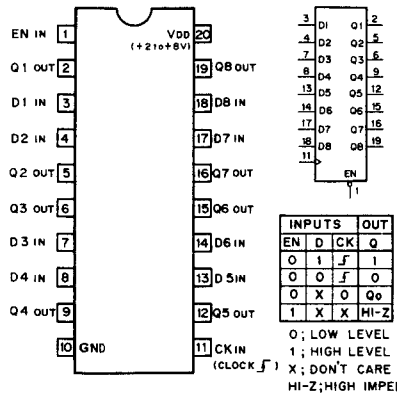


INPUTS			OUT
EN	D	G	Q
0	1	↑	1
0	0	↑	0
0	X	0	Q0
1	X	X	HI-Z

0 : LOW LEVEL
1 : HIGH LEVEL
X : DON'T CARE
HI-Z : HIGH IMPEDANCE

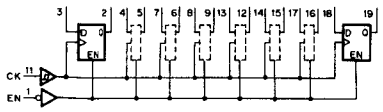


TC40H374F (TOSHIBA) FLAT PACKAGE
C-MOS 3-STATE OUTPUTS OCTAL D-TYPE FLIP-FLOP
— TOP VIEW —

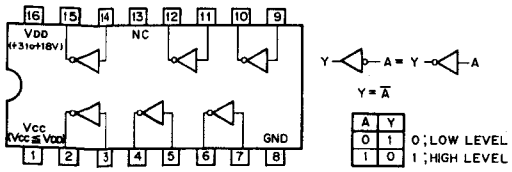


INPUTS			OUT
EN	D	CK	Q
0	1	↑	1
0	0	↑	0
0	X	0	Q0
1	X	X	HI-Z

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE
HI-Z ; HIGH IMPEDANCE



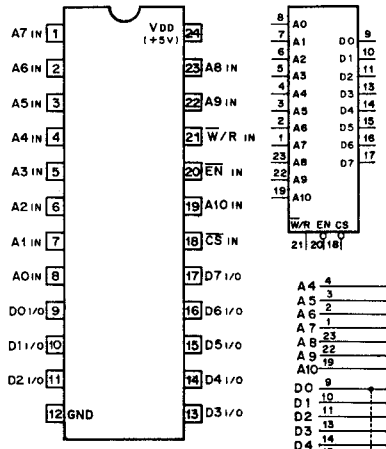
TC5020BP (TOSHIBA)
C-MOS LOW-TO-HIGH VOLTAGE TRANSLATION INVERTER
— TOP VIEW —



A	Y
0	1
1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL

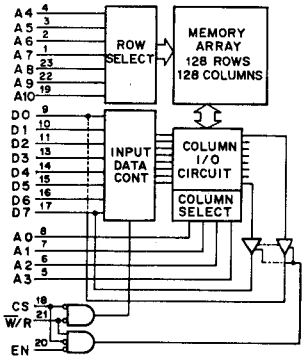
TC5517CFL-15 (TOSHIBA) (ACCESS TIME = 150 nS) FLAT PACKAGE
C-MOS 16384(2048x8)-BIT HIGH SPEED STATIC RAM
— TOP VIEW —



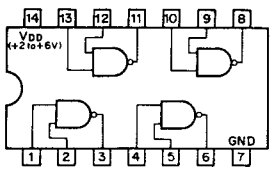
INPUTS			FUNCTION
CS	W/R	EN	
0	0	X	WRITE
0	1	0	READ
0	1	1	DISABLE (OUTPUT=HI-Z)
1	X	X	DISABLE (OUTPUT=HI-Z)

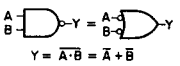
0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE
HI-Z ; HIGH IMPEDANCE

A0 – A10 ; ADDRESS INPUTS
W/R ; WRITE/READ ENABLE
EN ; OUTPUT ENABLE
CS ; CHIP SELECT
DO – D7 ; DATA INPUTS/OUTPUTS


ROW SELECT
MEMORY ARRAY 128 ROWS 128 COLUMNS
INPUT DATA CONT
COLUMN I/O CIRCUIT
COLUMN SELECT
A4 A5 A6 A7 A8 A9 A10
DO D1 D2 D3 D4 D5 D6 D7
A0 A1 A2 A3
CS W/R EN

SN74HC00ANS (TI) FLAT PACKAGE
C-MOS 2-INPUT NAND GATE
– TOP VIEW –

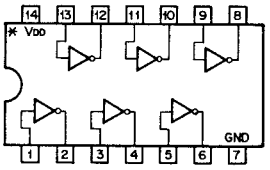


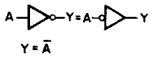


A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL

SN74HC04ANS (TI) FLAT PACKAGE
C-MOS INVERTER
– TOP VIEW –



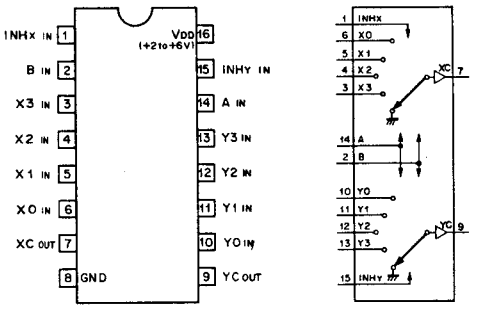


A	Y
0	1
1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL

* VDD HC, HCU ; +2 to +6V
HCT ; +5V

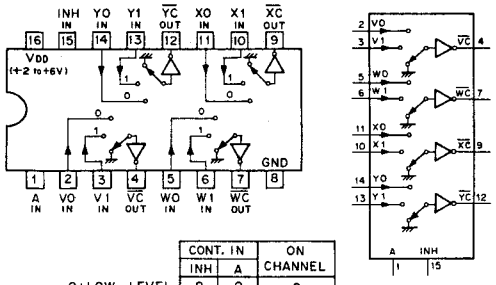
SN74HC153ANS (TI) FLAT PACKAGE
C-MOS 4-LINE-TO-1-LINE DATA SELECTOR/MULTIPLEXER
– TOP VIEW –



CONTROL IN			ON CHANNEL
INH	B	A	
0	0	0	0
0	0	1	1
0	1	0	2
0	1	1	3
1	X	X	GND

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

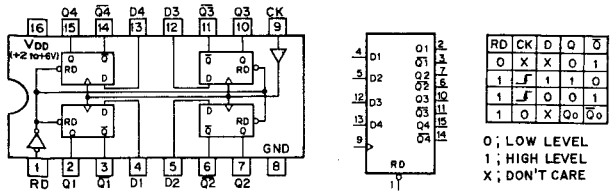
SN74HC158NS (TI) FLAT PACKAGE
C-MOS 2-LINE-TO-1-LINE INVERTED DATA SELECTOR/MULTIPLEXER
– TOP VIEW –



CONT. IN		ON CHANNEL
INH	A	
0	0	0
0	1	1
1	X	GND

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

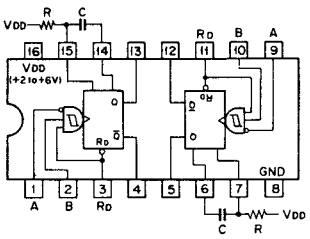
SN74HC175ANS (TI) FLAT PACKAGE
C-MOS D-TYPE FLIP-FLOP WITH RESET
– TOP VIEW –



RD	CK	D	Q	$\overline{Q}$
0	X	X	0	1
1	↑	1	1	0
1	↑	0	0	1
1	0	X	Q_0	$\overline{Q}_0$

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

TC74HC221AF (TOSHIBA) FLAT PACKAGE
C-MOS MONOSTABLE MULTIVIBRATOR WITH SCHMITT TRIGGER INPUT
– TOP VIEW –

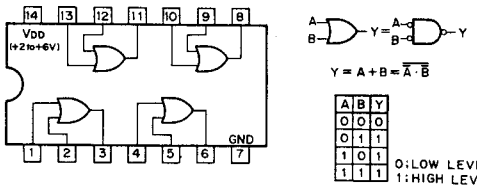


INPUTS			OUTPUTS	
RD	A	B	Q	$\overline{Q}$
0	X	X	0	1
X	1	X	0	1
X	X	0	0	1
1	0	↑	⎍	⎍
1	↓	1	⎍	⎍
↑	0	1	⎍	⎍

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

OUTPUT PULSE WIDTH = 0.7CR

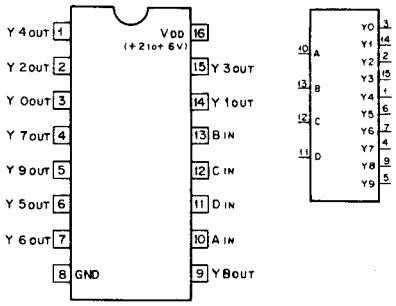
SN74HC32ANS (TI) FLAT PACKAGE
TC74HC32F (TOSHIBA) FLAT PACKAGE
C-MOS 2-INPUT OR GATE
– TOP VIEW –



A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

0 ; LOW LEVEL
1 ; HIGH LEVEL

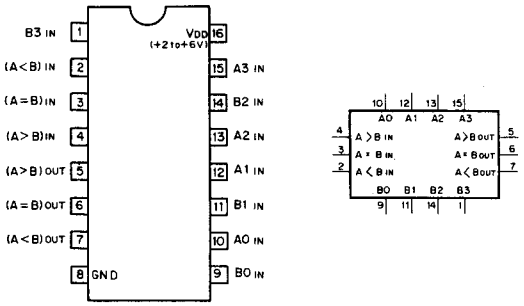
TC74HC4028AF (TOSHIBA) FLAT PACKAGE
TC74HC4028F (TOSHIBA) FLAT PACKAGE
C-MOS BCD TO DECIMAL DECODER
– TOP VIEW –



STATE	INPUTS				OUTPUTS									
	D	C	B	A	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9
0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
1	0	0	0	1	0	1	0	0	0	0	0	0	0	0
2	0	0	1	0	0	0	1	0	0	0	0	0	0	0
3	0	0	1	1	0	0	0	1	0	0	0	0	0	0
4	0	1	0	0	0	0	0	0	1	0	0	0	0	0
5	0	1	0	1	0	0	0	0	0	1	0	0	0	0
6	0	1	1	0	0	0	0	0	0	0	1	0	0	0
7	0	1	1	1	0	0	0	0	0	0	0	1	0	0
8	1	X	X	0	0	0	0	0	0	0	0	0	1	0
9	1	X	X	1	0	0	0	0	0	0	0	0	0	1

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

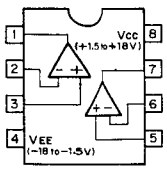
SN74HC85NS (TI) FLAT PACKAGE
TC74HC85F (TOSHIBA) FLAT PACKAGE
C-MOS 4-BIT MAGNITUDE COMPARATOR
– TOP VIEW –



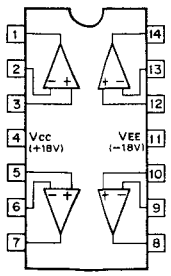
INPUTS								OUTPUTS		
DATA COMPARING					CASCADING					
	A3 , B3	A2 , B2	A1 , B1	A0 , B0	A<B	A=B	A>B	A<B	A=B	A>B
A>B	A3 > B3	X	X	X	X	X	X	0	0	1
	A3 = B3	A2 > B2	X	X						
	A3 = B3	A2 = B2	A1 > B1	X						
	A3 = B3	A2 = B2	A1 = B1	A0 > B0						
A=B	A3 = B3	A2 = B2	A1 = B1	A0 = B0	0	0	0	1	0	1
					0	0	1	0	0	1
					X	1	X	0	1	0
					1	0	0	1	0	0
					1	0	1	0	0	0
A<B	A3 = B3	A2 = B2	A1 = B1	A0 < B0	X	X	X	1	0	0
	A3 = B3	A2 = B2	A1 < B1	X						
	A3 = B3	A2 < B2	X	X						
	A3< B3	X	X	X						

0; LOW LEVEL 1; HIGH LEVEL X; DON'T CARE

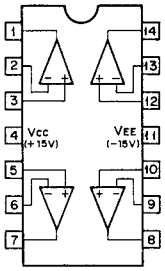
TL062ACP (TI)
OPERATIONAL AMPLIFIER
(JFET INPUT)
– TOP VIEW –



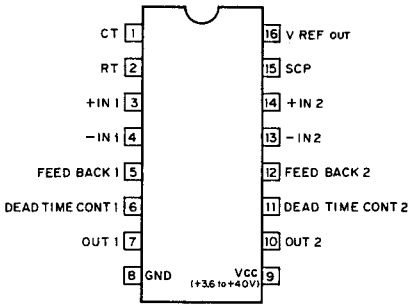
TL064CNS (TI) FLAT PACKAGE
OPERATIONAL AMPLIFIER
(J FET-INPUT)
– TOP VIEW –

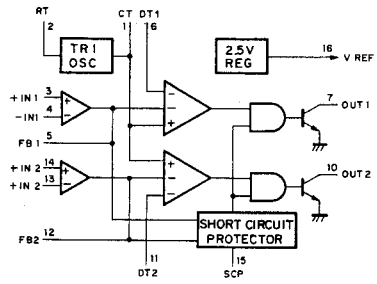


TL084CNS (TI) FLAT PACKAGE
OPERATIONAL AMPLIFIER
(J FET-INPUT)
– TOP VIEW –

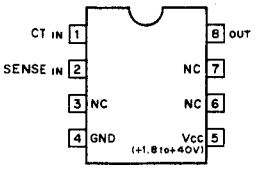


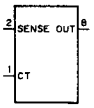
TL1451CNS (TI) FLAT PACKAGE
DUAL PWM POWER CONTROLLER
– TOP VIEW –

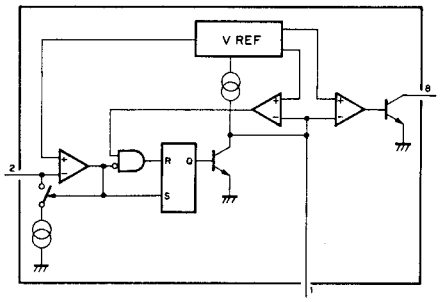




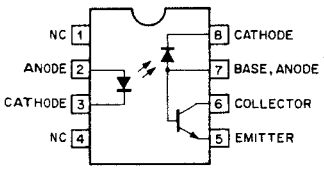
TL7700CP (TI) FLAT PACKAGE
TL7700 CPS (TI) FLAT PACKAGE
VARIABLE SUPPLY VOLTAGE SUPERVISOR
— TOP VIEW —



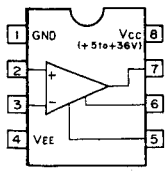




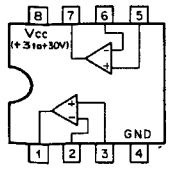
TLP651 (TOSHIBA)
PHOTO COUPLER
— TOP VIEW —



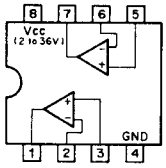
uPC311G2 (NEC) FLAT PACKAGE
VOLTAGE COMPARATOR
— TOP VIEW —



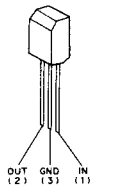
uPC358G2 (NEC) FLAT PACKAGE
DUAL OPERATIONAL AMPLIFIERS
— TOP VIEW —



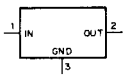
uPC393G2 (NEC) FLAT PACKAGE
VOLTAGE COMPARATOR
— TOP VIEW —



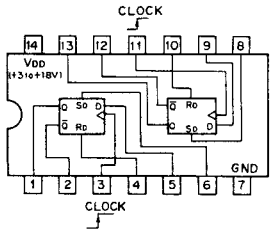
uPC78L??A (NEC)
POSITIVE VOLTAGE REGULATOR (100mA)



OUTPUT VOLTAGE	uPC78L??	uPC78L??A
5V	uPC78L05	uPC78L05A
8V	uPC78L08	
12V	uPC78L12	
15V	uPC78L15	



uPD4013BG (NEC)
C-MOS D-TYPE FLIP-FLOP WITH DIRECT SET/RESET
— TOP VIEW —



DIRECT R-S FLIP FLOP

Sd	Rd	Q	$\overline{Q}$
0	0	On	$\overline{On}$
0	1	0	1
1	0	1	0
1	1	1	1

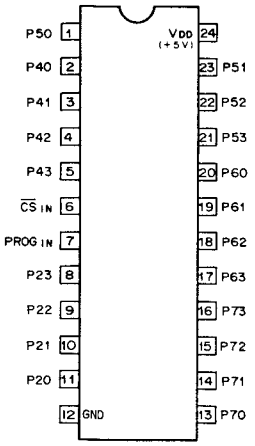
0: LOW LEVEL
1: HIGH LEVEL

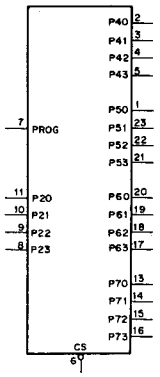
D-TYPE FLIP FLOP

CKn	CKn+1
D	Q
0	0
1	1

CLOCK CK: ⌐
CKn: BEFORE CLOCK
CKn+1: AFTER CLOCK

uPD82C43G (NEC) FLAT PACKAGE
C-MOS I/O PORT EXPANDER
— TOP VIEW —



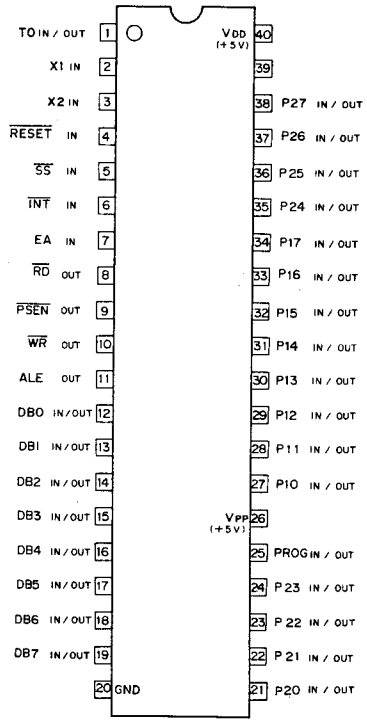


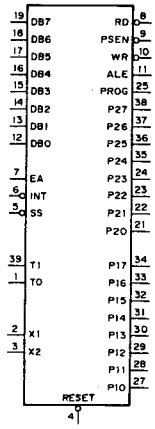
CONTROL AND PORT ADDRESSING

P23	P22	P21	P20	PORT	CONTROL
0	0	0	0	4	READ
0	0	0	1	5	
0	0	1	0	6	
0	0	1	1	7	
0	1	0	0	4	WRITE
0	1	0	1	5	
0	1	1	0	6	
0	1	1	1	7	
1	0	0	0	4	OR
1	0	0	1	5	
1	0	1	0	6	
1	0	1	1	7	
1	1	0	0	4	AND
1	1	0	1	5	
1	1	1	0	6	
1	1	1	1	7	

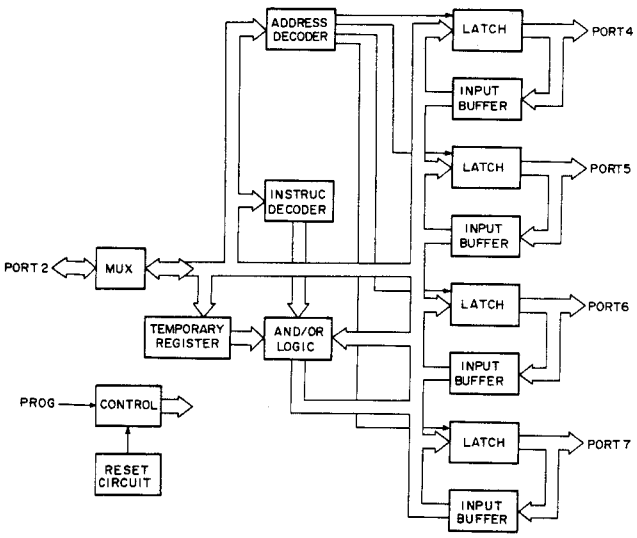
PROG ; PROGRAM PULSE INPUT
$\overline{CS}$; CHIP SELECT INPUT
P20~P23 ; I/O PORT 2 (FOR CPU)
P40~P43 ; I/O PORT 4
P50~P53 ; I/O PORT 5
P60~P63 ; I/O PORT 6
P70~P73 ; I/O PORT 7

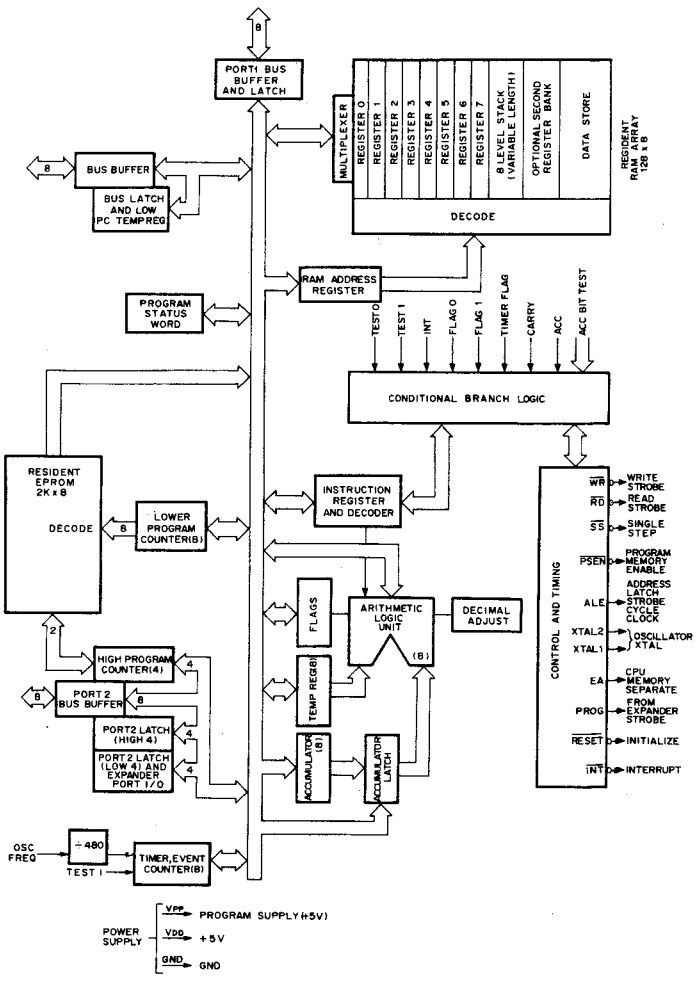
uPD8749HD (NEC)
N-MOS 8-BIT MICROPROCESSOR
— TOP VIEW —



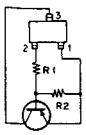


ALE ; ADDRESS LATCH ENABLE
$\overline{PSEN}$; PROGRAM STORE ENABLE
$\overline{SS}$; SINGLE STEP
EA ; EXTERNAL ACCESS
PROG ; PROGRAM PULSE
$\overline{RD}$; READ
$\overline{WR}$; WRITE



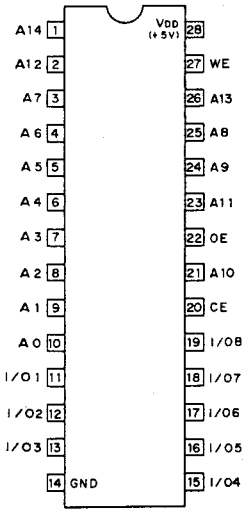


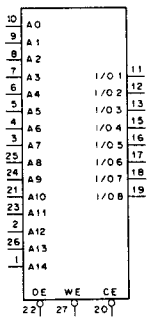
TOP VIEW (SCALE 4/1)



DTA143XK (R1 = 4.7K, R2 = 10K)

CXK58257AM-10L (SONY) FLAT PACKAGE
CXK58257M-10L (SONY) FLAT PACKAGE
C-MOS 256K (32768 × 8)-BIT STATIC RAM
– TOP VIEW –

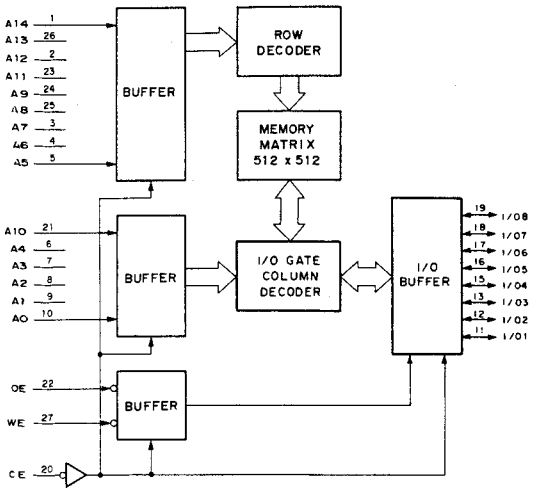




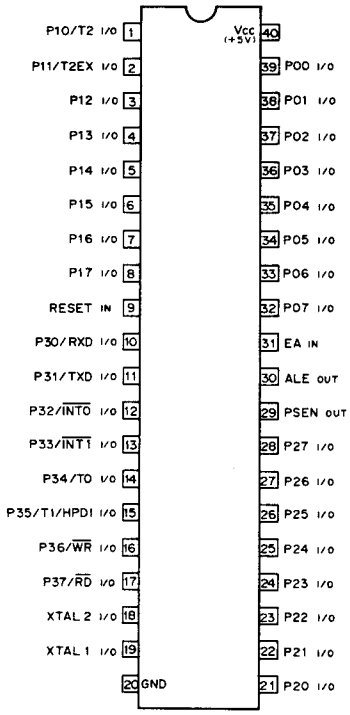
A0 – A14	: ADDRESS INPUTS
CE	: CHIP ENABLE INPUT
I/O1 – I/O8	: DATA INPUTS/OUTPUTS
OE	: OUTPUT ENABLE INPUT
WE	: WRITE ENABLE INPUT

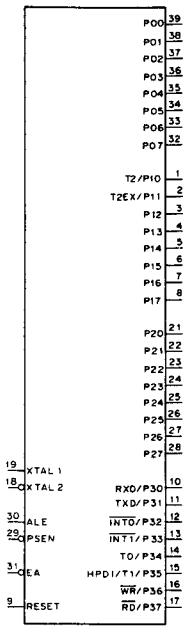
CE	OE	WE	MODE	I/O TERMINAL
1	×	×	NOT SELECT	HIGH IMPEDANCE
0	1	1	OUTPUT DISABLE	HIGH IMPEDANCE
0	0	1	READ	OUTPUT DATA
0	×	0	WRITE	INPUT DATA

0 : LOW LEVEL
1 : HIGH LEVEL
× : DON'T CARE

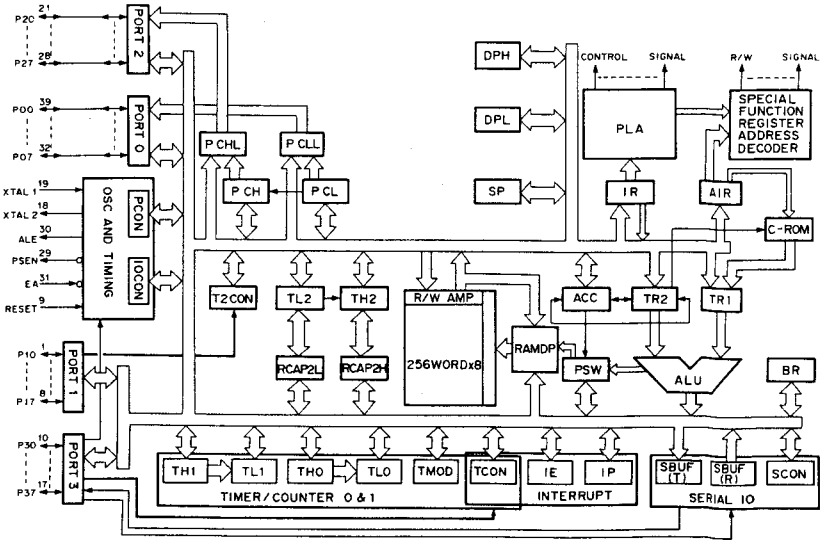


MSM80C154RS (OKI)
C-MOS 8-BIT MICROCOMPUTER
– TOP VIEW –



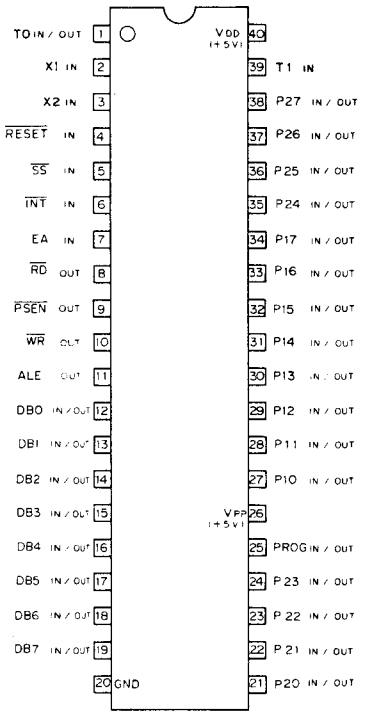


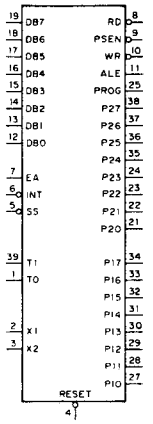
ALE	: ADDRESS LATCH ENABLE OUTPUT
EA	: CPU MEMORY SEPARATE INPUT
HPDI	: HARD POWER DOWN INPUT
INT0, INT1	: EXTERNAL INTERRUPT
P00 – P07	: PORT 0 (BUS PORT) INPUT/OUTPUT
P10 – P17	: PORT 1 INPUT/OUTPUT
P20 – P27	: PORT 2 INPUT/OUTPUT
P30 – P37	: PORT 3 INPUT OUTPUT
PSEN	: PROGRAM STORE ENABLE OUTPUT
RD	: EXTERNAL DATA MEMORY READ STROBE
RESET	: RESET INPUT
RXD	: SERIAL INPUT PORT
T0 – T2	: TIMER COUNTER EXTERNAL CLOCK
T2EX	: TIMER COUNTER 2 EXTERNAL CONTROL
TXD	: SERIAL OUTPUT PORT
WR	: EXTERNAL DATA MEMORY WRITE STROBE
XTAL1, XTAL2	: CRYSTAL



MSM80C49-830RS (OKI)
MSM80C49-831RS (OKI)
MSM80C49-884RS (OKI)

N-MOS 8-BIT MICROPROCESSOR
– TOP VIEW –

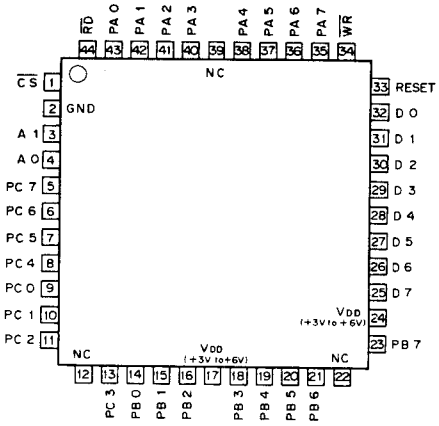

T0 IN / OUT 1
X1 IN 2
X2 IN 3
RESET IN 4
SS IN 5
INT IN 6
EA IN 7
RD OUT 8
PSEN OUT 9
WR OUT 10
ALE OUT 11
DB0 IN / OUT 12
DB1 IN / OUT 13
DB2 IN / OUT 14
DB3 IN / OUT 15
DB4 IN / OUT 16
DB5 IN / OUT 17
DB6 IN / OUT 18
DB7 IN / OUT 19
20 GND
VDD (+5V) 40
39 T1 IN
38 P27 IN / OUT
37 P26 IN / OUT
36 P25 IN / OUT
35 P24 IN / OUT
34 P17 IN / OUT
33 P16 IN / OUT
32 P15 IN / OUT
31 P14 IN / OUT
30 P13 IN / OUT
29 P12 IN / OUT
28 P11 IN / OUT
27 P10 IN / OUT
VPP (+5V) 26
25 PROG IN / OUT
24 P23 IN / OUT
23 P22 IN / OUT
22 P21 IN / OUT
21 P20 IN / OUT

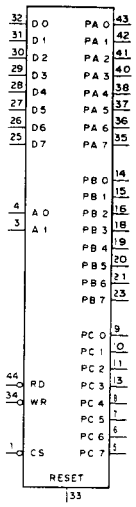


ALE ; ADDRESS LATCH ENABLE
PSEN ; PROGRAM STORE ENABLE
SS ; SINGLE STEP
EA ; EXTERNAL ACCESS
PROG ; PROGRAM PULSE
RD ; READ
WR ; WRITE

MSM82C55A-2GS (OKI) FLAT PACKAGE

C-MOS PROGRAMMABLE PERIPHERAL INTERFACE
– TOP VIEW –

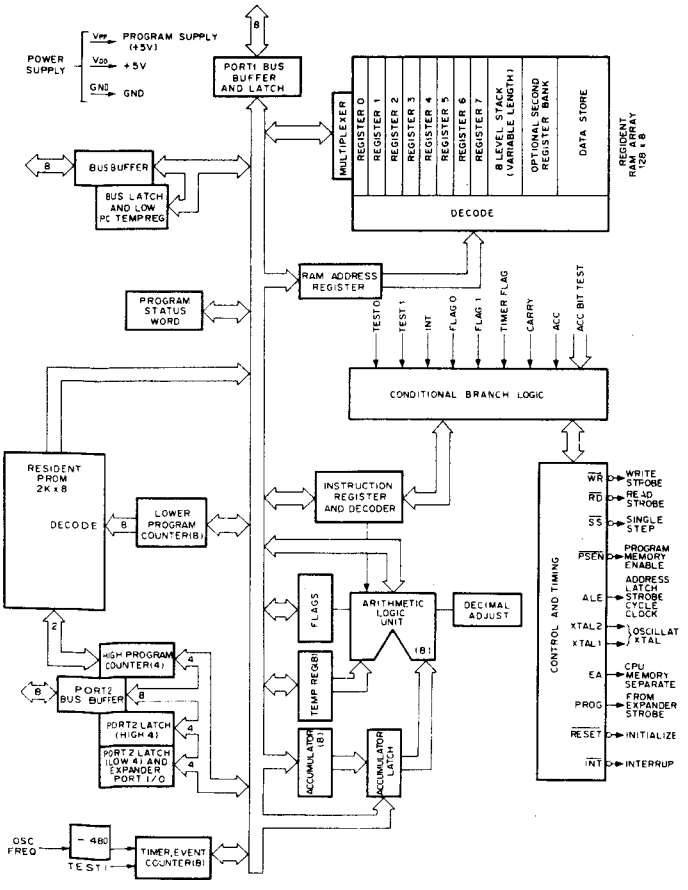


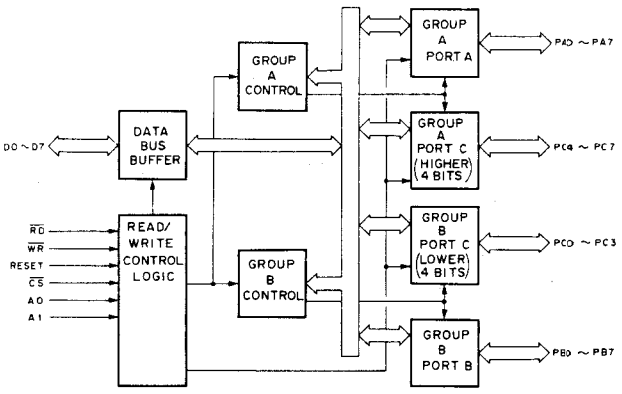


A1	A0	$\overline{CS}$	$\overline{WR}$	$\overline{RD}$	OPERATION
0	0	0	1	0	PORT A → DATA BUS
0	1	0	1	0	PORT B → DATA BUS
1	0	0	1	0	PORT C → DATA BUS
1	1	0	1	0	NO OPERATION
0	0	0	0	1	DATA BUS → PORT A
0	1	0	0	1	DATA BUS → PORT B
1	0	0	0	1	DATA BAS → PORT C
1	1	0	0	1	DATA BUS → CONTROL REGISTER
X	X	1	X	X	HIGH IMPEDANCE

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

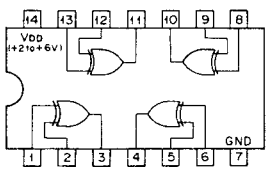
A0, A1 ; PORT SELECT ADDRESS
$\overline{CS}$; CHIP SELECT
D0~7 ; DATA BUS
PA0~7 ; PORT A IN/OUT
PB0~7 ; PORT B IN/OUT
PC0~7 ; PORT C IN/OUT
$\overline{RD}$; READ
$\overline{WR}$; WRITE

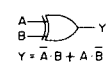




SN74HC386NS (TI) FLAT PACKAGE

C-MOS EXCLUSIVE-OR GATE
– TOP VIEW –





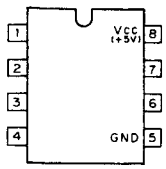
A	B	X
0	0	0
0	1	1
1	0	1
1	1	0

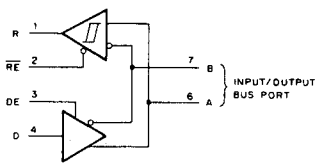
0 ; LOW LEVEL
1 ; HIGH LEVEL

SN75176BP (TI)

TTL-DIFFERENTIAL BUS TRANSCEIVER

– TOP VIEW –





FUNCTION TABLE

– DRIVER –

INPUT	ENABLE	OUTPUT	
D	DE	A	B
1	1	1	0
0	1	0	1
X	0	HI-Z	HI-Z

– RECEIVER –

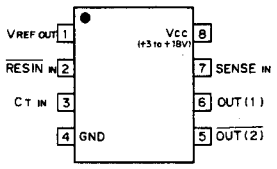
DIFFERENTIAL INPUTS	ENABLE	OUTPUT
A-B	$\overline{RE}$	R
$V_{ID} > 0.2V$	0	1
$-0.2V < V_{ID} < 0.2V$	0	?
$V_{ID} < -0.2V$	0	0
X	1	HI-Z

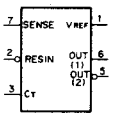
1 : HIGH LEVEL
0 : LOW LEVEL
X : DON'T CARE
HI-Z : HIGH IMPEDANCE
? : INDETERMINATE

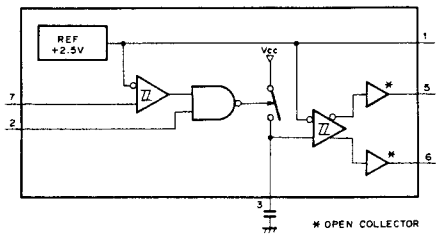
TL7705CPS-B (TI) FLAT PACKAGE

POWER VOLTAGE SUPERVISOR

– TOP VIEW –



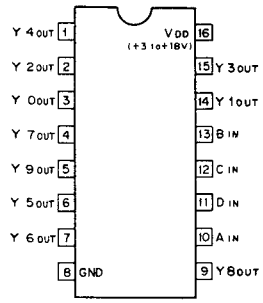


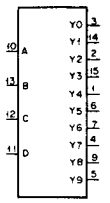


TC4028BF (TOSHIBA) FLAT PACKAGE

C-MOS BCD TO DECIMAL DECODER

– TOP VIEW –





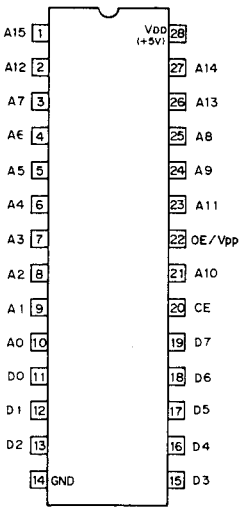
STATE	INPUTS				OUTPUTS									
	D	C	B	A	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9
0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
1	0	0	0	1	0	1	0	0	0	0	0	0	0	0
2	0	0	1	0	0	0	1	0	0	0	0	0	0	0
3	0	0	1	1	0	0	0	1	0	0	0	0	0	0
4	0	1	0	0	0	0	0	0	1	0	0	0	0	0
5	0	1	0	1	0	0	0	0	0	1	0	0	0	0
6	0	1	1	0	0	0	0	0	0	0	1	0	0	0
7	0	1	1	1	0	0	0	0	0	0	0	1	0	0
8	1	0	0	0	0	0	0	0	0	0	0	0	1	0
9	1	0	0	1	0	0	0	0	0	0	0	0	0	1
10	1	0	1	0	0	0	0	0	0	0	0	0	0	0
11	1	0	1	1	0	0	0	0	0	0	0	0	0	0
12	1	1	0	0	0	0	0	0	0	0	0	0	0	0
13	1	1	0	1	0	0	0	0	0	0	0	0	0	0
14	1	1	1	0	0	0	0	0	0	0	0	0	0	0
15	1	1	1	1	0	0	0	0	0	0	0	0	0	0

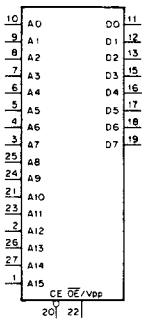
0 : LOW LEVEL
1 : HIGH LEVEL

TMS27C512-20JL (TI)

C-MOS 512K (65,536x8 = 524,288)-BIT ERASABLE PROM

– TOP VIEW –

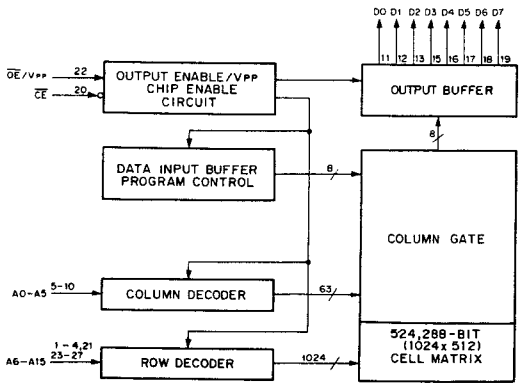




A0 – A15 : ADDRESS INPUTS
CE : CHIP ENABLE INPUT
D0 – D7 : DATA OUTPUTS
OE : OUTPUT ENABLE INPUT
V_{PP} : PROGRAM POWER SUPPLY

An	CE	$\overline{OE}/V_{PP}$	V_{DD}	Dn	FUNCTION
A_{IN}	0	0	+5V	D_{OUT}	READ
A_{IN}	0	1	+5V	HI-Z	OUTPUT DISABLE
X	1	X	+5V	HI-Z	STANDBY
A_{IN}	0	+12.5V	+6V	D_{IN}	PGM
A_{IN}	0	0	+6V	D_{OUT}	PGM VERIFY
X	1	+12.5V	+6V	HI-Z	PGM INH

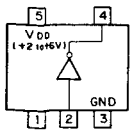
0 : LOW LEVEL
1 : HIGH LEVEL
X : DON'T CARE
HI-Z : HIGH IMPEDANCE

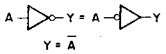


TC7S04F (TOSHIBA) FLAT PACKAGE

C-MOS INVERTER

– TOP VIEW –





$Y = \overline{A}$

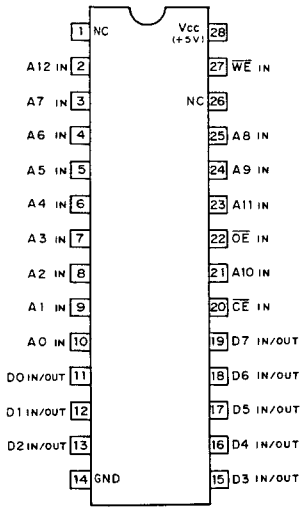
A	Y
0	1
1	0

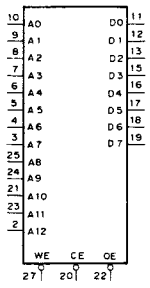
0; LOW LEVEL
1; HIGH LEVEL

UPD28C64C-20 (NEC) (ACCESS TIME = 200nS)

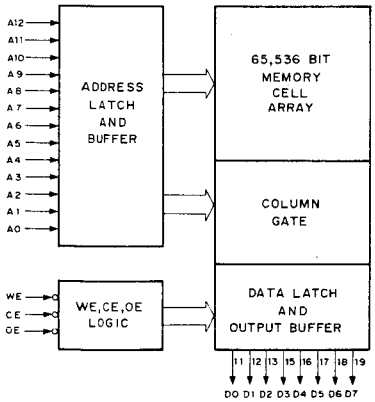
C-MOS 64K (8Kx8) ELECTRICALLY ERASABLE PROM

– TOP VIEW –



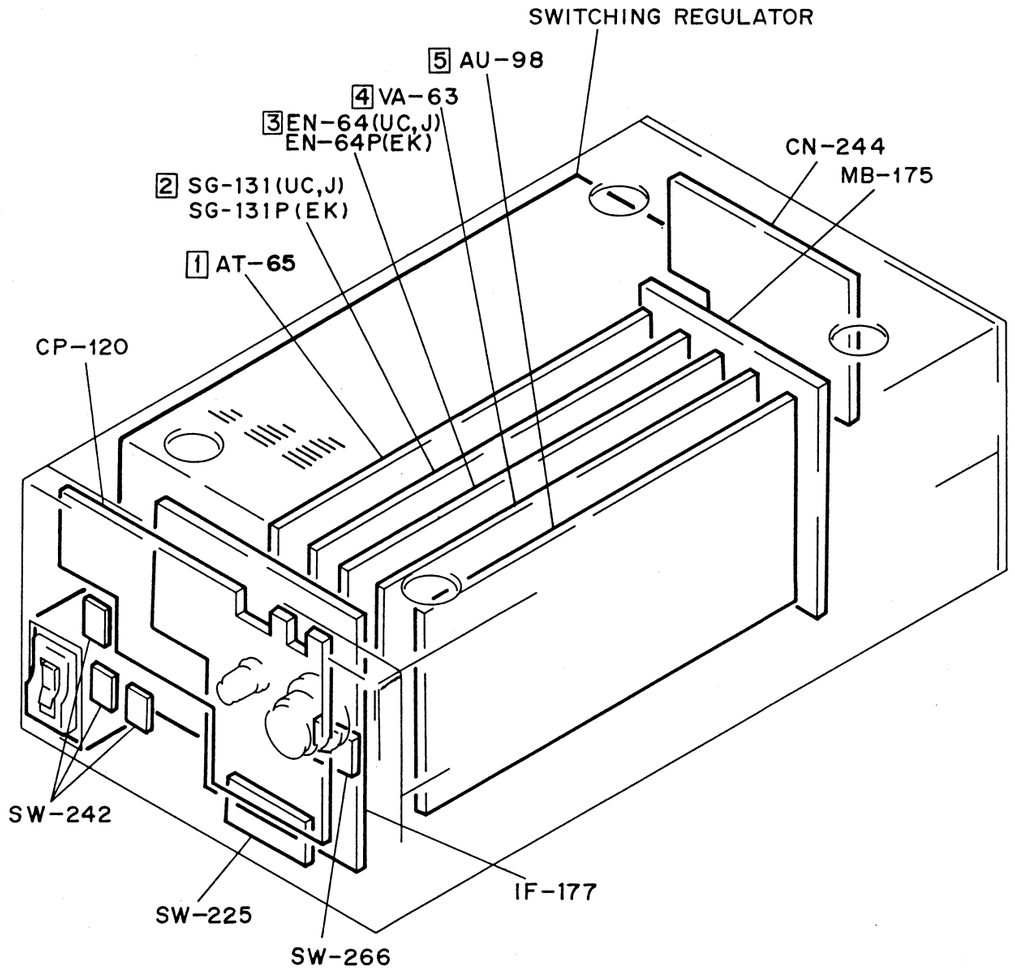


A0 – A12 ; ADDRESS INPUTS
D0 – D7 ; DATA INPUTS/OUTPUTS
WE ; WRITE ENABLE INPUT
CE ; CHIP ENABLE INPUT
OE ; OUTPUT ENABLE INPUT



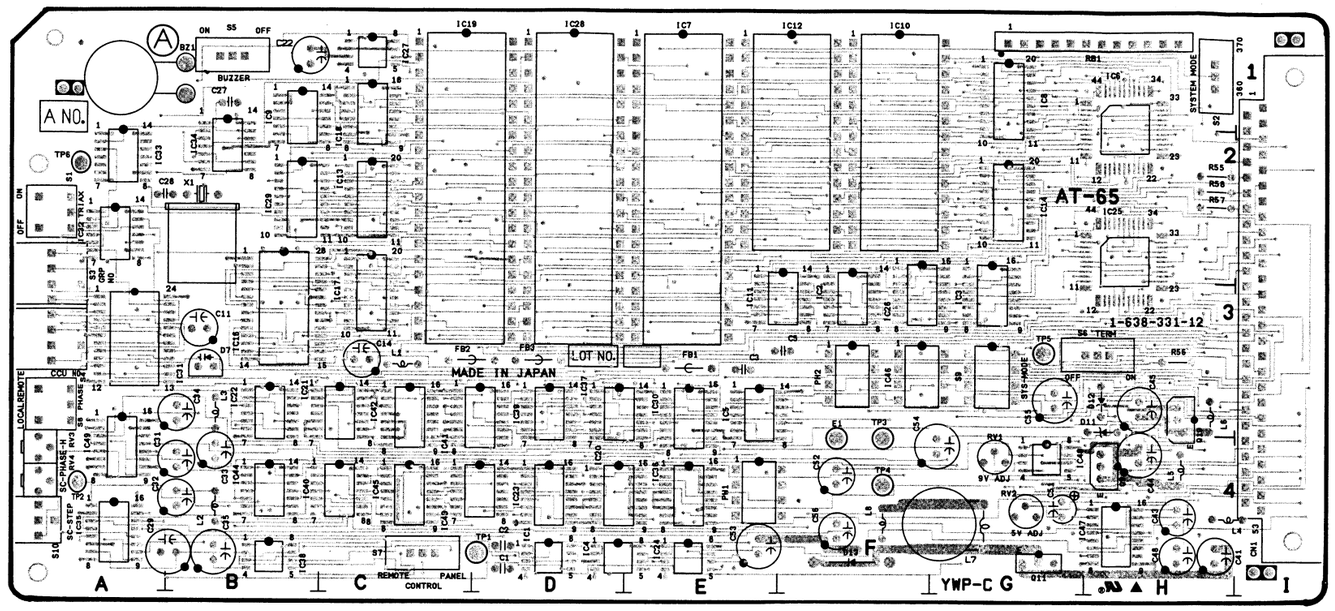
SECTION C
SCHEMATIC DIAGRAMS AND BOARD ILLUSTRATIONS

BOARD LAYOUT



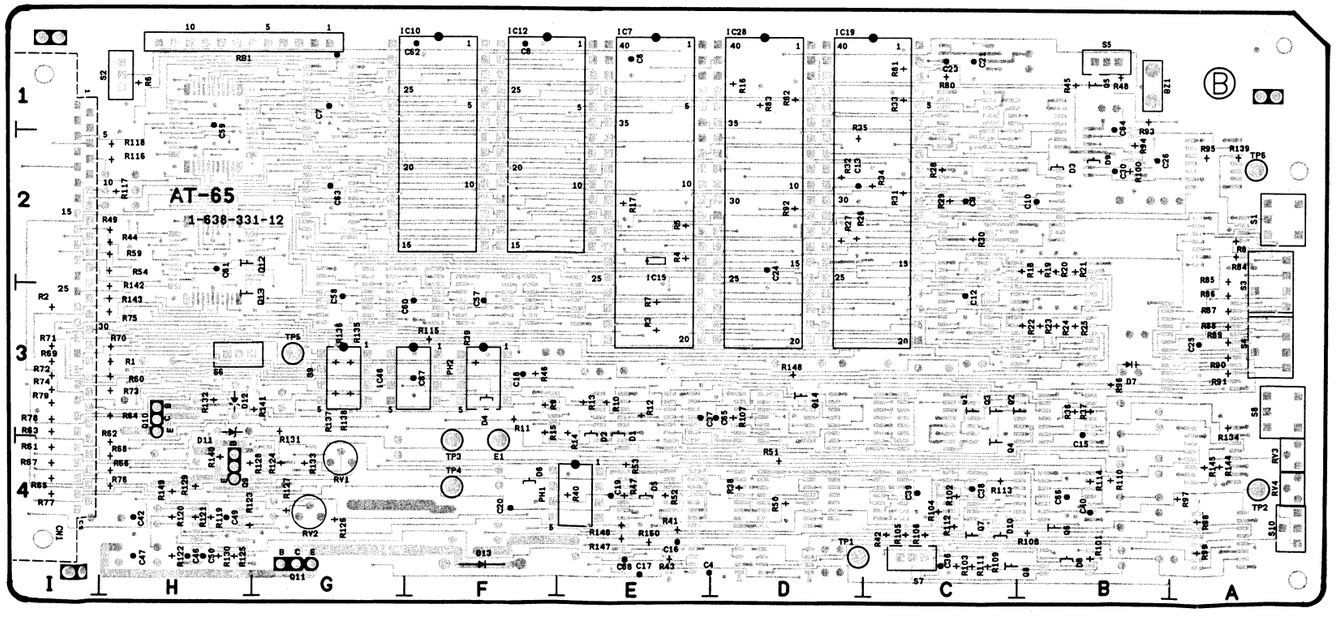
AT-65 BOARD

COMPONENT SIDE



1-638-331-12 COMPONENT SIDE

SOLDERING SIDE

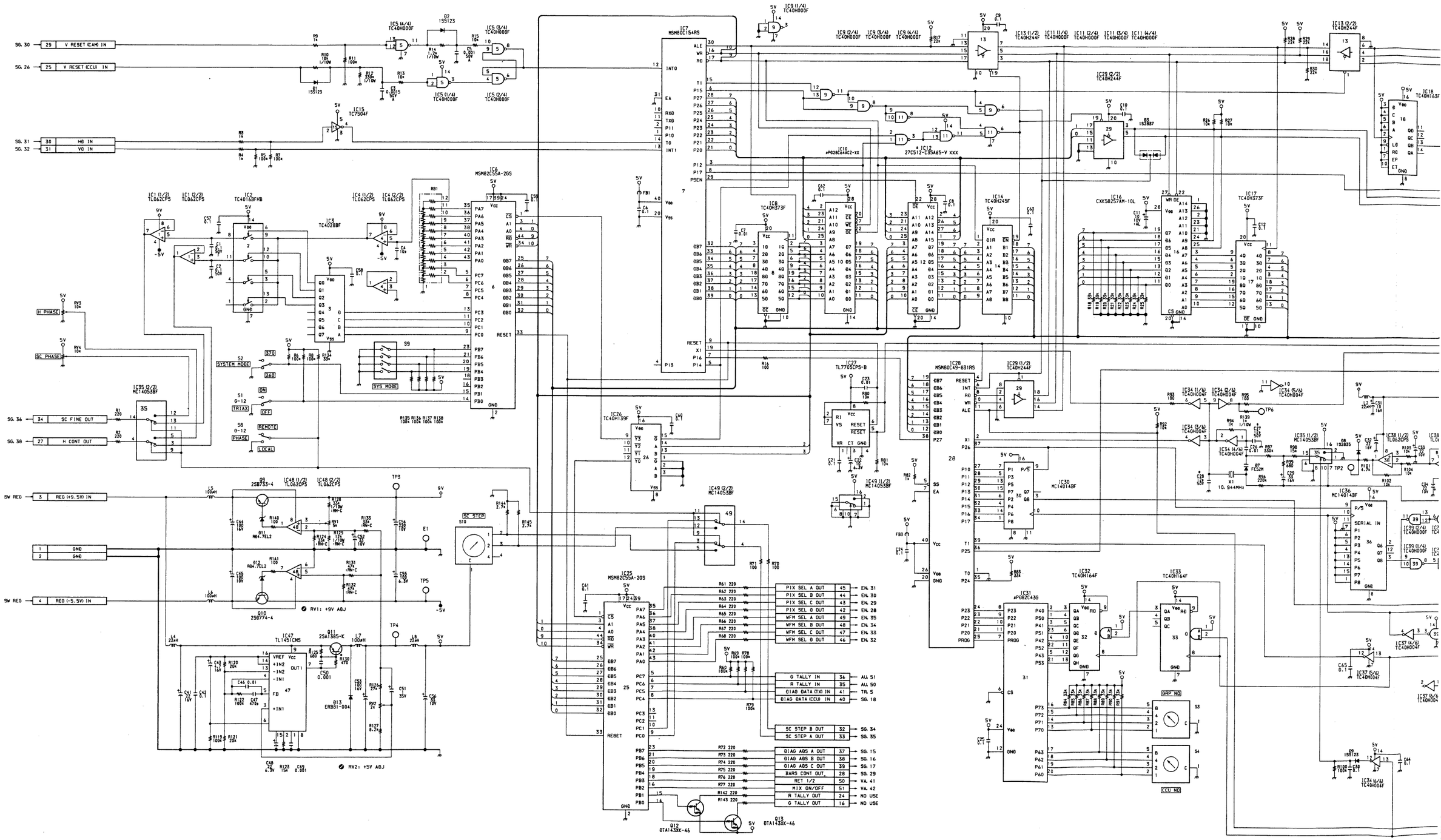


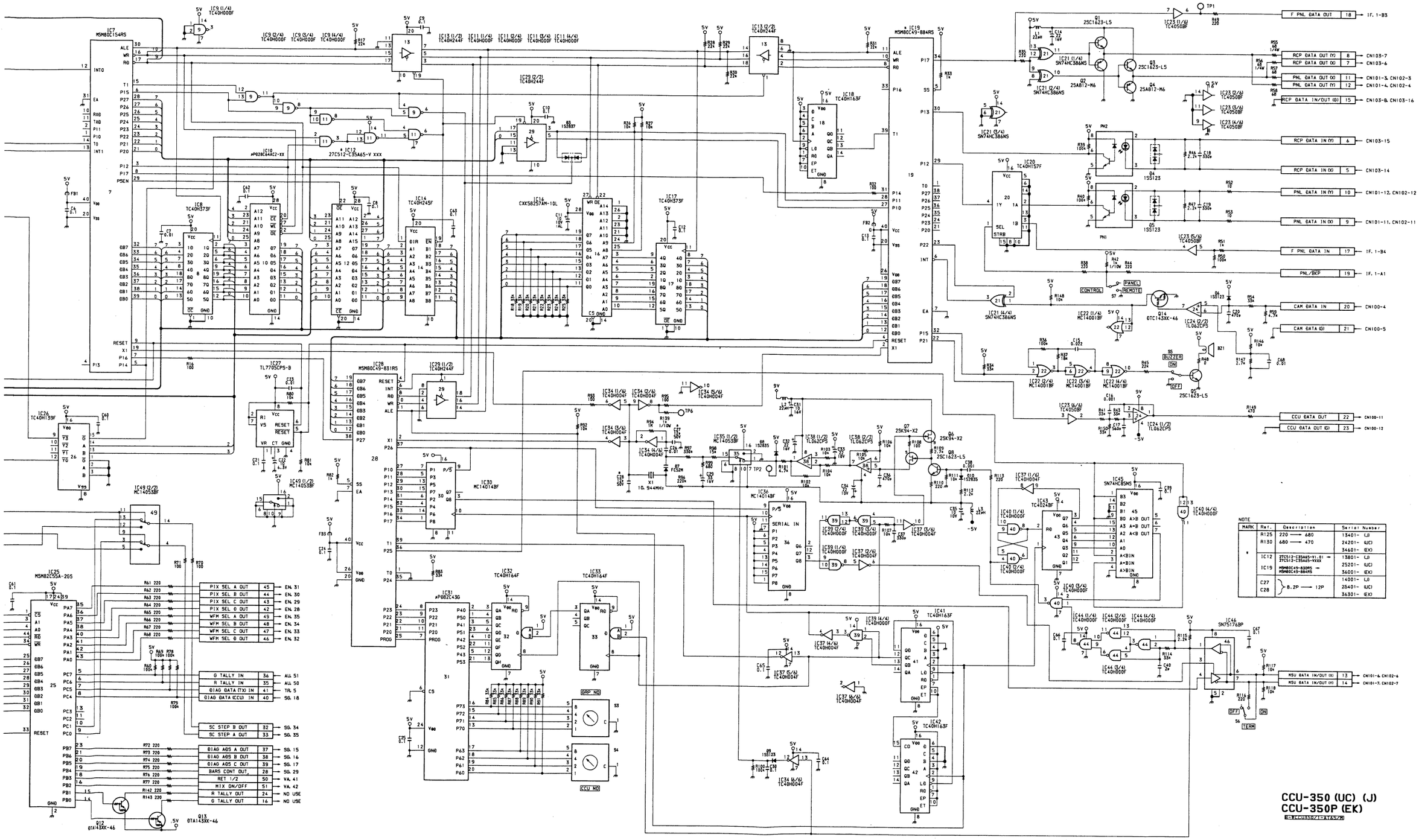
1-638-331-12 SOLDERING SIDE

AT-65 1-638-331-12

BZ1	B1	IC25	H2	S5	B1
		IC26	F3	S6	H3
CN17	E1	IC27	C1	S7	C4
		IC28	D1	S8	A3
CNI10	F1	IC29	B2	S9	G3
CNI12	F1	IC30	E3	S10	A4
CNI19	C1	IC31	B3		
CNI28	D1	IC32	A2	TP1	D4
		IC33	A2	TP2	A4
CN1	I4	IC34	B2	TP3	F3
		IC35	A4	TP4	F4
D1	E3	IC36	E4	TP5	G3
D2	E3	IC37	D3	TP6	A2
D3	B2	IC38	B4		
D4	F3	IC39	D3	X1	B2
D5	E4	IC40	B4		
D6	F4	IC41	C4		
D7	B3	IC42	C3		
D8	B4	IC43	C4		
D9	B2	IC44	B4		
D10	C4	IC45	C4		
D11	H3	IC46	F3		
D12	H3	IC47	G4		
D13	F4	IC48	G4		
		IC49	A4		
E1	F3				
		PH1	E4		
FB1	E3	PH2	F3		
FB2	C3				
FB3	D3	Q1	C3		
		Q2	C3		
IC1	D4	Q3	C3		
IC2	F3	Q4	C4		
IC3	G3	Q5	B1		
IC4	D4	Q6	B4		
IC5	E3	Q7	C4		
IC6	H1	Q8	B4		
IC7	E1	Q9	H4		
IC8	G1	Q10	H3		
IC9	B1	Q11	G4		
IC10	F1	Q12	G2		
IC11	E3	Q13	F3		
IC12	F1	Q14	D3		
IC13	C2				
IC14	G2	RB1	H1		
IC15	E2				
IC16	B3	RV1	G4		
IC17	C3	RV2	G4		
IC18	C2	RV3	A4		
IC19	C1	RV4	A4		
IC20	D4				
IC21	B3	S1	A2		
IC22	B3	S2	H1		
IC23	D4	S3	A3		
IC24	E4	S4	A3		

AT-65 BOARD : AUTO CONTROL SYSTEM


SG. 30 29 V RESET (CAM) IN
SG. 26 25 V RESET (CCU) IN
SG. 31 30 HD IN
SG. 32 31 VD IN
SG. 36 34 SC FINE OUT
SG. 38 27 H CONT OUT
SW REG 3 REG (+9.5V) IN
1 GND
2 GND
SW REG 4 REG (-5.5V) IN
H PHASE
SC PHASE
SYSTEM MODE
SYS MODE
REMOTE
LOCAL
TRIAX
SC STEP
RV1: +9V ADJ
RV2: +5V ADJ
IC7 MSM80C154RS
IC8 MSM82C55A-2DS
IC25 MSM82C55A-2DS
IC10 μPD28C64C2-XX
IC12 27C512-C35A65-V XXX
IC28 MSM80C45-831RS
IC30 MC14014BF
IC31 μPD82C43G
IC32 TC40H164F
IC33 TC40H164F
IC36 MC14014BF
PIX SEL A OUT 45 EN. 31
PIX SEL B OUT 44 EN. 30
PIX SEL C OUT 43 EN. 29
PIX SEL D OUT 42 EN. 28
WFM SEL A OUT 49 EN. 35
WFM SEL B OUT 48 EN. 34
WFM SEL C OUT 47 EN. 33
WFM SEL D OUT 46 EN. 32
G TALLY IN 36 ALL 51
R TALLY IN 35 ALL 50
DIAG DATA (TX) IN 41 TR. 5
DIAG DATA (CCU) IN 40 SG. 18
SC STEP B OUT 32 SG. 34
SC STEP A OUT 33 SG. 35
DIAG ADS A OUT 37 SG. 15
DIAG ADS B OUT 38 SG. 16
DIAG ADS C OUT 39 SG. 17
BARS CONT OUT 28 SG. 29
RET 1/2 50 VA. 41
MIX ON/OFF 51 VA. 42
R TALLY OUT 24 NO USE
G TALLY OUT 16 NO USE
GRP NO
CCU NO



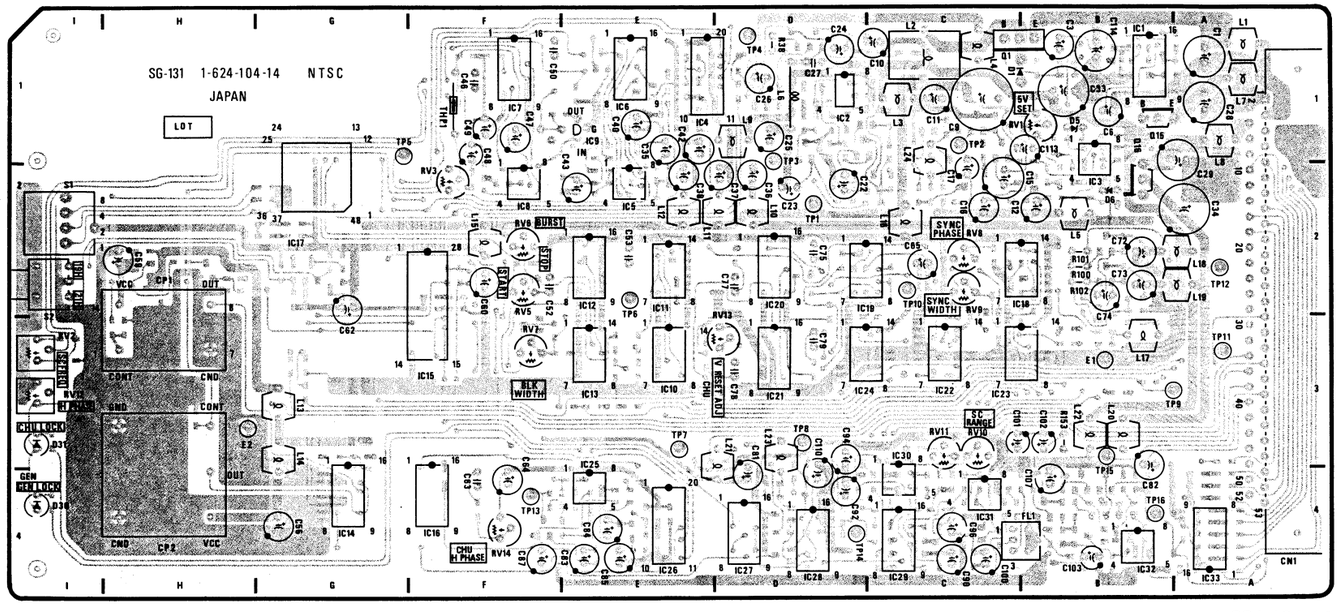
NOTE

MARK	Ref.	Description	Serial Number
*	R125	220 → 680	13401- (J)
	R130	680 → 470	24201- (UC)
			34601- (EK)
	IC12	27C512-C35A65-V1.01 → 27C512-C35A65-VXXX	13801- (J)
	IC19	MSM80C49-830RS → MSM80C49-884RS	25201- (UC)
			56001- (EK)
	C27 C28	8.2P → 12P	14001- (J)
			25401- (UC)
			36301- (EK)

CCU-350 (UC) (J)
CCU-350P (EK)

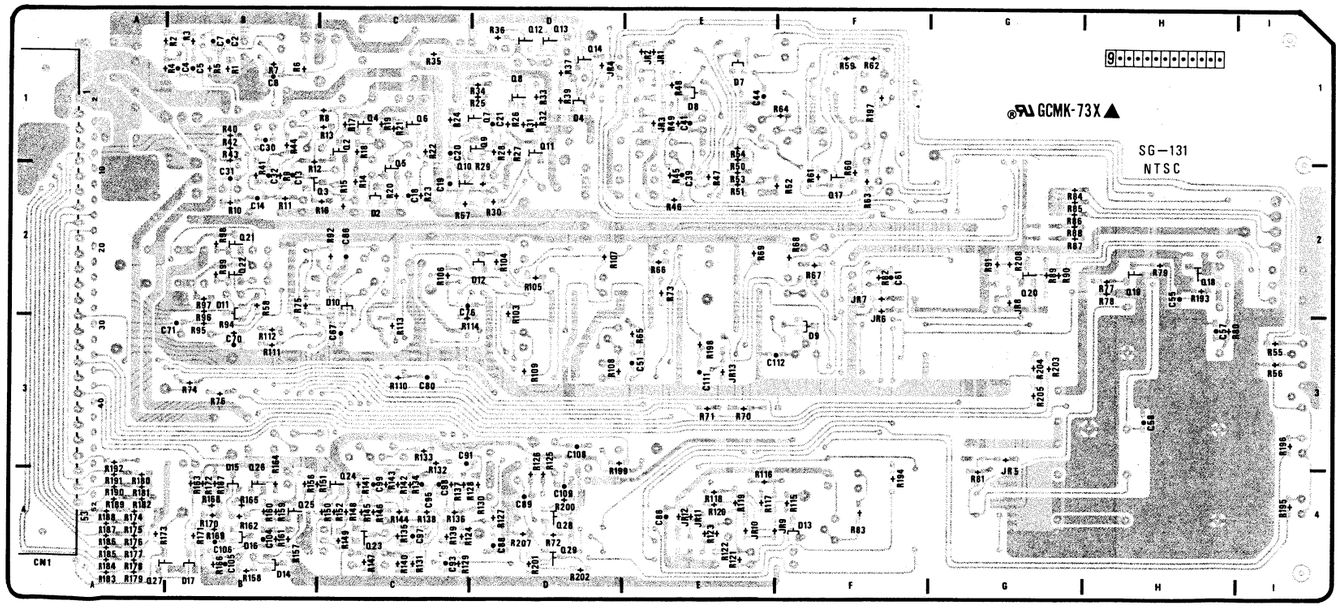
SG-131 BOARD

COMPONENT SIDE



1-624-104-14

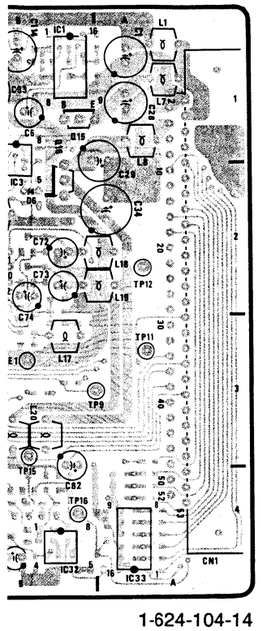
SOLDERING SIDE



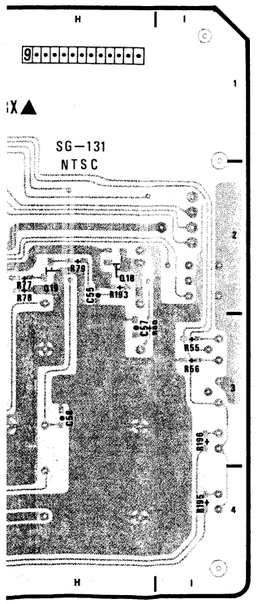
1-624-104-14

SG-131 1-624-104-14

CN1	A-4	IC24	D-3	Q18	H-2
		IC25	E-4	Q19	H-2
CP1	H-2	IC26	E-4	Q20	G-2
CP2	H-4	IC27	D-4	Q21	B-2
		IC28	D-4	Q22	B-2
D1	C-1	IC29	C-4	Q23	C-4
D2	C-2	IC30	C-4	Q24	C-4
D4	D-1	IC31	C-4	Q25	B-4
D5	B-1	IC32	B-4	Q26	B-4
D6	B-2	IC33	A-4	Q27	A-4
D7	E-1			Q28	D-4
D8	E-1	L1	A-1	Q29	D-4
D9	F-3	L2	C-1		
D10	C-2	L3	C-1	RV1	C-1
D11	B-2	L4	C-1	RV2	I-3
D12	D-2	L5	B-2	RV3	F-2
D13	F-4	L6	D-1	RV5	F-2
D14	B-4	L7	A-1	RV6	F-2
D15	B-4	L8	A-1	RV7	F-3
D16	B-4	L9	D-1	RV8	C-2
D17	B-4	L10	D-2	RV9	C-2
D30	I-4	L11	E-2	RV10	C-3
D31	I-3	L12	E-2	RV11	C-3
		L13	G-3	RV12	I-3
E1	B-3	L14	G-3	RV13	D-3
E2	H-3	L15	F-2	RV14	F-4
		L16	C-2		
FL1	B-4	L17	B-3	THP1	F-1
		L18	A-2		
IC1	B-1	L19	A-2	TP1	D-2
IC2	D-1	L20	B-3	TP2	C-1
IC3	B-2	L21	D-3	TP3	D-1
IC4	E-1	L22	B-3	TP4	D-1
IC5	E-2	L23	D-3	TP5	G-1
IC6	E-1	L24	C-1	TP6	E-2
IC7	F-1			TP7	E-3
IC8	F-2	Q1	C-1	TP8	D-3
IC9	E-1	Q2	C-1	TP9	B-3
IC10	E-3	Q3	B-2	TP10	C-2
IC11	E-2	Q4	C-1	TP11	A-3
IC12	E-2	Q5	C-2	TP12	A-2
IC13	E-3	Q6	C-1	TP13	F-4
IC14	G-4	Q7	D-1	TP14	D-4
IC15	F-2	Q8	D-1	TP15	B-3
IC16	F-4	Q9	D-1	TP16	B-4
IC17	G-2	Q10	C-2		
IC18	C-2	Q11	D-1		
IC19	D-2	Q12	D-1		
IC20	D-2	Q13	D-1		
IC21	D-3	Q14	D-1		
IC22	C-3	Q15	B-1		
IC23	C-3	Q16	B-2		
		Q17	F-2		



1-624-104-14

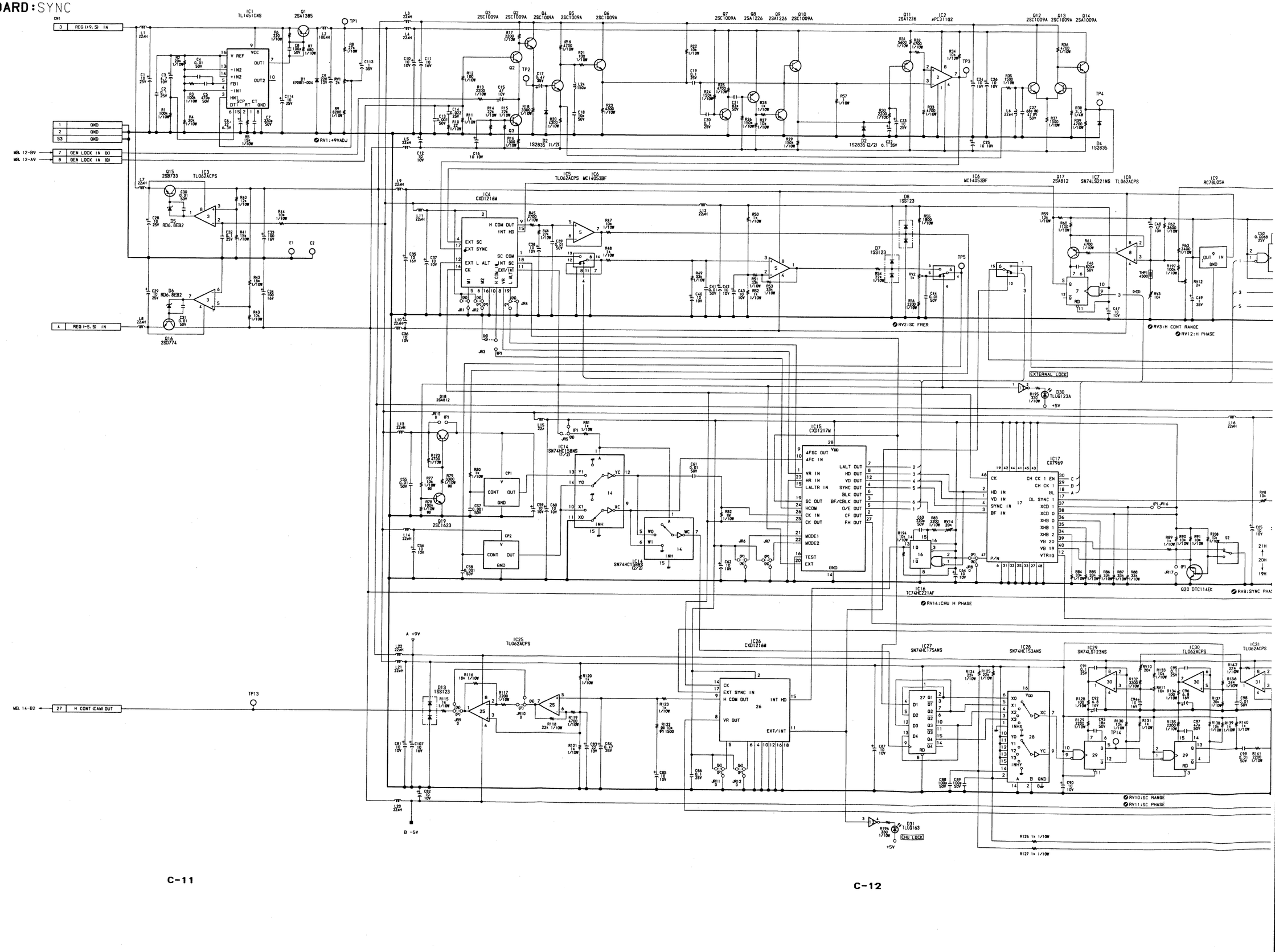


1-624-104-14

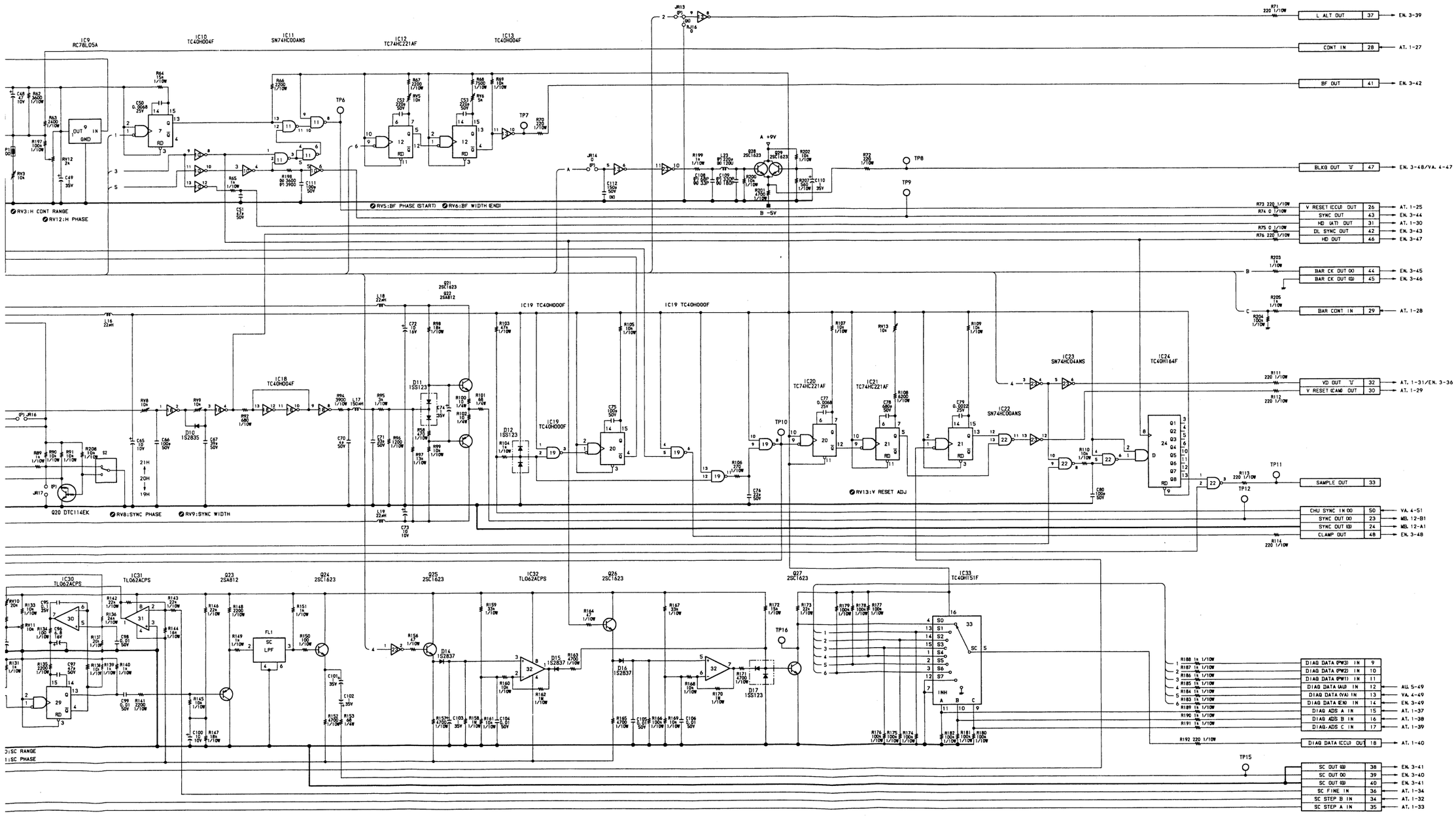
SG-131 1-624-104-14

CN1	A-4	IC24	D-3	Q18	H-2
		IC25	E-4	Q19	H-2
CP1	H-2	IC26	E-4	Q20	G-2
CP2	H-4	IC27	D-4	Q21	B-2
		IC28	D-4	Q22	B-2
D1	C-1	IC29	C-4	Q23	C-4
D2	C-2	IC30	C-4	Q24	C-4
D4	D-1	IC31	C-4	Q25	B-4
D5	B-1	IC32	B-4	Q26	B-4
D6	B-2	IC33	A-4	Q27	A-4
D7	E-1			Q28	D-4
D8	E-1	L1	A-1	Q29	D-4
D9	F-3	L2	C-1		
D10	C-2	L3	C-1	RV1	C-1
D11	B-2	L4	C-1	RV2	I-3
D12	D-2	L5	B-2	RV3	F-2
D13	F-4	L6	D-1	RV5	F-2
D14	B-4	L7	A-1	RV6	F-2
D15	B-4	L8	A-1	RV7	F-3
D16	B-4	L9	D-1	RV8	C-2
D17	B-4	L10	D-2	RV9	C-2
D30	I-4	L11	E-2	RV10	C-3
D31	I-3	L12	E-2	RV11	C-3
		L13	G-3	RV12	I-3
E1	B-3	L14	G-3	RV13	D-3
E2	H-3	L15	F-2	RV14	F-4
		L16	C-2		
FL1	B-4	L17	B-3	THP1	F-1
		L18	A-2		
IC1	B-1	L19	A-2	TP1	D-2
IC2	D-1	L20	B-3	TP2	C-1
IC3	B-2	L21	D-3	TP3	D-1
IC4	E-1	L22	B-3	TP4	D-1
IC5	E-2	L23	D-3	TP5	G-1
IC6	E-1	L24	C-1	TP6	E-2
IC7	F-1			TP7	E-3
IC8	F-2	Q1	C-1	TP8	D-3
IC9	E-1	Q2	C-1	TP9	B-3
IC10	E-3	Q3	B-2	TP10	C-2
IC11	E-2	Q4	C-1	TP11	A-3
IC12	E-2	Q5	C-2	TP12	A-2
IC13	E-3	Q6	C-1	TP13	F-4
IC14	G-4	Q7	D-1	TP14	D-4
IC15	F-2	Q8	D-1	TP15	B-3
IC16	F-4	Q9	D-1	TP16	B-4
IC17	G-2	Q10	C-2		
IC18	C-2	Q11	D-1		
IC19	D-2	Q12	D-1		
IC20	D-2	Q13	D-1		
IC21	D-3	Q14	D-1		
IC22	C-3	Q15	B-1		
IC23	C-3	Q16	B-2		
		Q17	F-2		

BOARD NAME
SG-131/131P BOARD: SYNC



CCU-350 (UC), (J)
CCU 350P (EK)


IC9 RC78L05A
IC10 TC40H004F
IC11 SN74HC00ANS
IC12 TC74HC221AF
IC13 TC40H004F
IC18 TC40H004F
IC19 TC40H000F
IC20 TC74HC221AF
IC21 TC74HC221AF
IC22 SN74HC00ANS
IC23 SN74HC04ANS
IC24 TC40H164F
IC30 TL062ACPS
IC31 TL062ACPS
IC32 TL062ACPS
IC33 TC40H151F
Q20 DTC114EK
Q21 2SC1623
Q22 2SA812
Q23 2SA812
Q24 2SC1623
Q25 2SC1623
Q26 2SC1623
Q27 2SC1623
Q28 2SC1623
Q29 2SC1623
D10 1S2835
D11 1SS123
D12 1SS123
D14 1S2837
D15 1S2837
D16 1S2837
D17 1SS123
FL1 SC LPF
RV3:H CONT RANGE
RV12:H PHASE
RV5:BF PHASE (START)
RV6:BF WIDTH (END)
RV8:SYNC PHASE
RV9:SYNC WIDTH
RV13:V RESET ADJ
A +9V
B -5V
TP6
TP7
TP8
TP9
TP10
TP11
TP12
TP15
TP16
L ALT OUT 37 → EN. 3-39
CONT IN 28 → AT. 1-27
BF OUT 41 → EN. 3-42
BLKG OUT 47 → EN. 3-48/VA. 4-47
V RESET (CCU) OUT 26 → AT. 1-25
SYNC OUT 43 → EN. 3-44
HD (AT) OUT 31 → AT. 1-30
DL SYNC OUT 42 → EN. 3-43
HD OUT 46 → EN. 3-47
BAR CK OUT 00 44 → EN. 3-45
BAR CK OUT 01 45 → EN. 3-46
BAR CONT IN 29 → AT. 1-28
VD OUT 32 → AT. 1-31/EN. 3-36
V RESET (CAM) OUT 30 → AT. 1-29
SAMPLE OUT 33
CHU SYNC IN 00 50 → VA. 4-51
SYNC OUT 00 23 → MBL. 12-B1
SYNC OUT 01 24 → MBL. 12-A1
CLAMP OUT 48 → EN. 3-48
DIAG DATA (PW3) IN 9
DIAG DATA (PW2) IN 10
DIAG DATA (PW1) IN 11
DIAG DATA (AU) IN 12 → ALL 5-49
DIAG DATA (VA) IN 13 → VA. 4-49
DIAG DATA (EN) IN 14 → EN. 3-49
DIAG ADS A IN 15 → AT. 1-37
DIAG ADS B IN 16 → AT. 1-38
DIAG ADS C IN 17 → AT. 1-39
DIAG DATA (CCU) OUT 18 → AT. 1-40
SC OUT 01 38 → EN. 3-41
SC OUT 00 39 → EN. 3-40
SC OUT 02 40 → EN. 3-41
SC FINE IN 36 → AT. 1-34
SC STEP B IN 34 → AT. 1-32
SC STEP A IN 35 → AT. 1-33

C-13

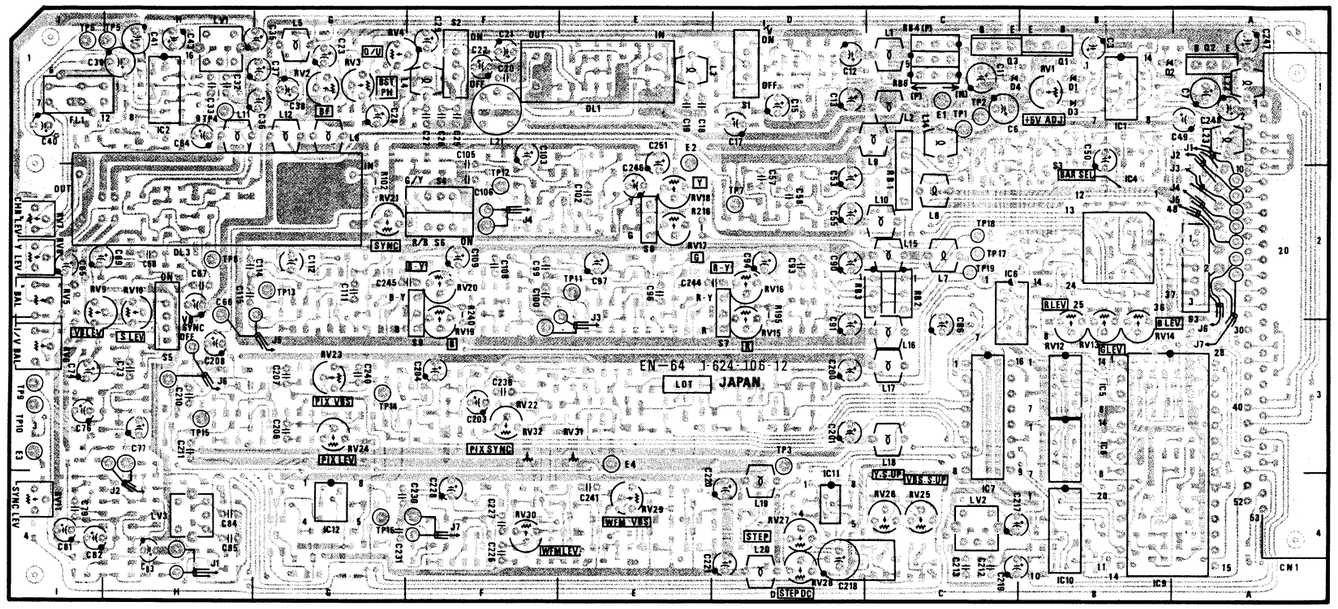
C-14

CCU-350 (UC) (J)
CCU-350P (EK)

B-CCU350-SG131M803

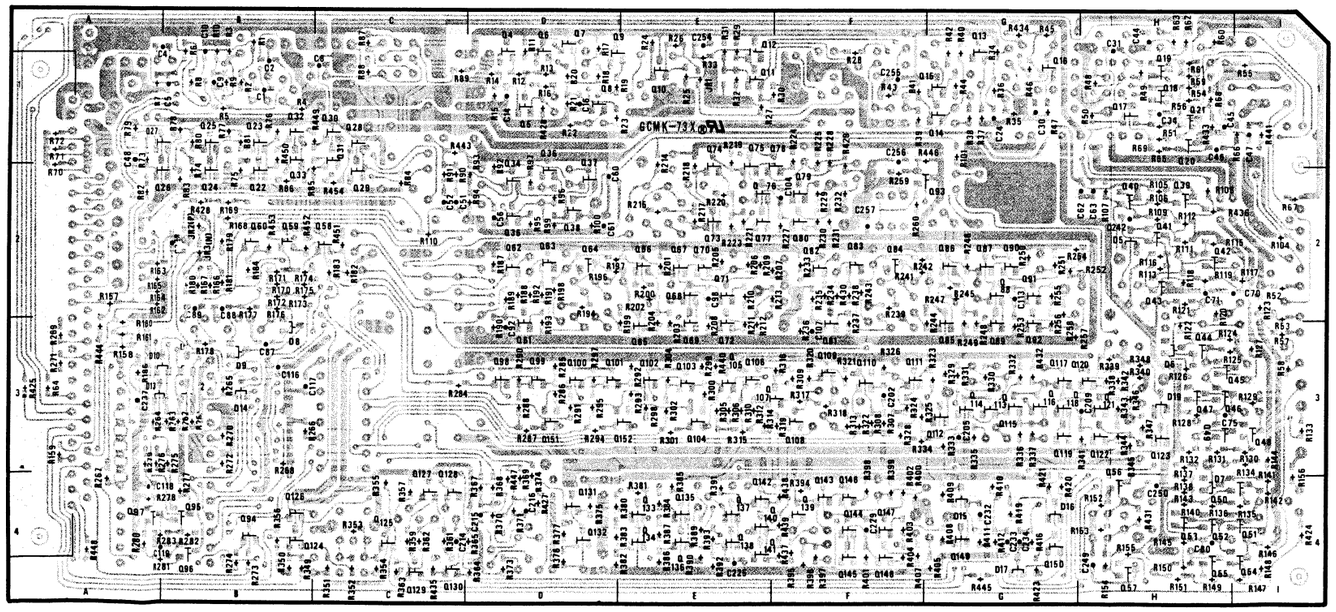
EN-64/64P BOARD

COMPONENT SIDE



1-624-106-12

SOLDERING SIDE



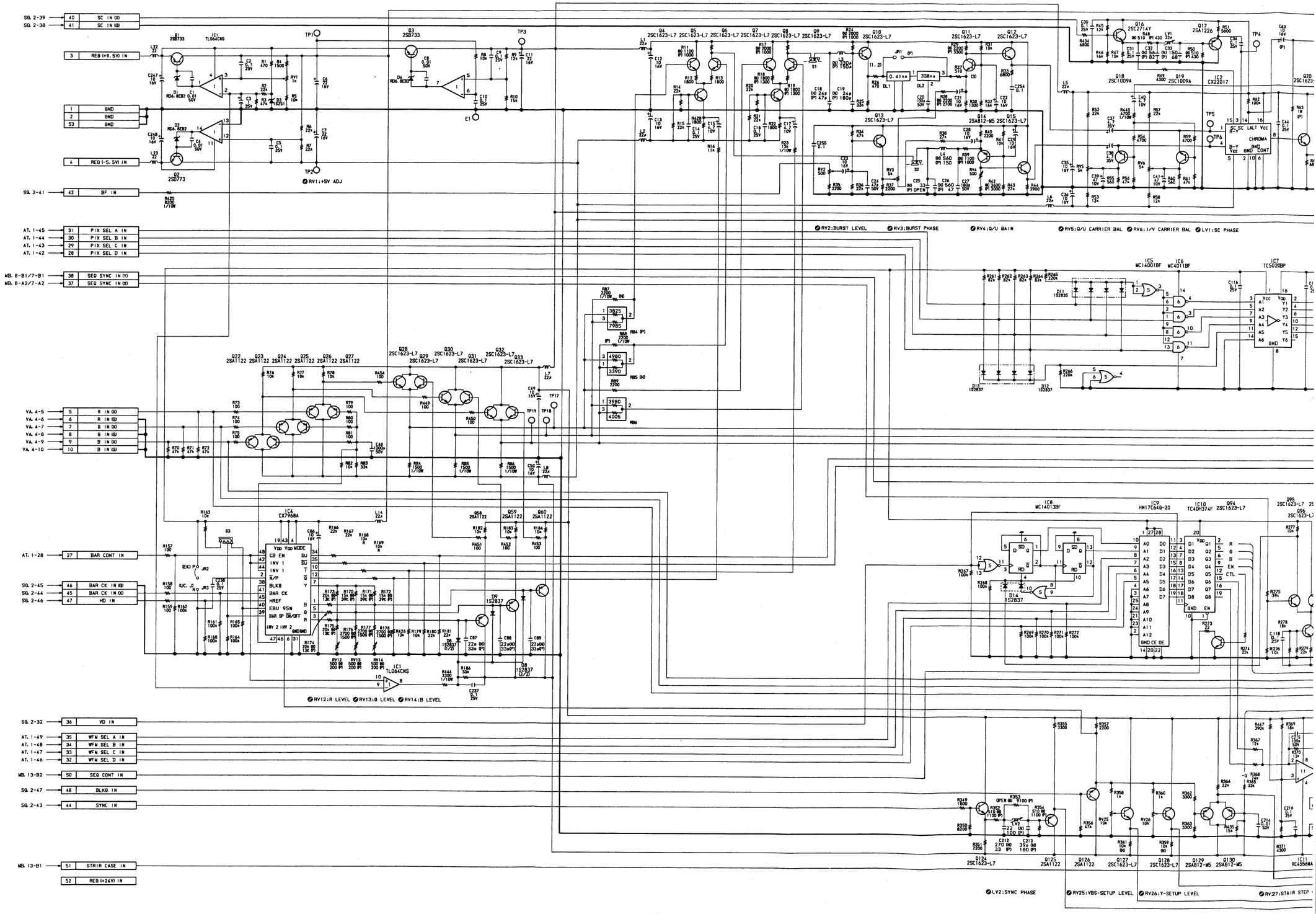
1-624-106-12

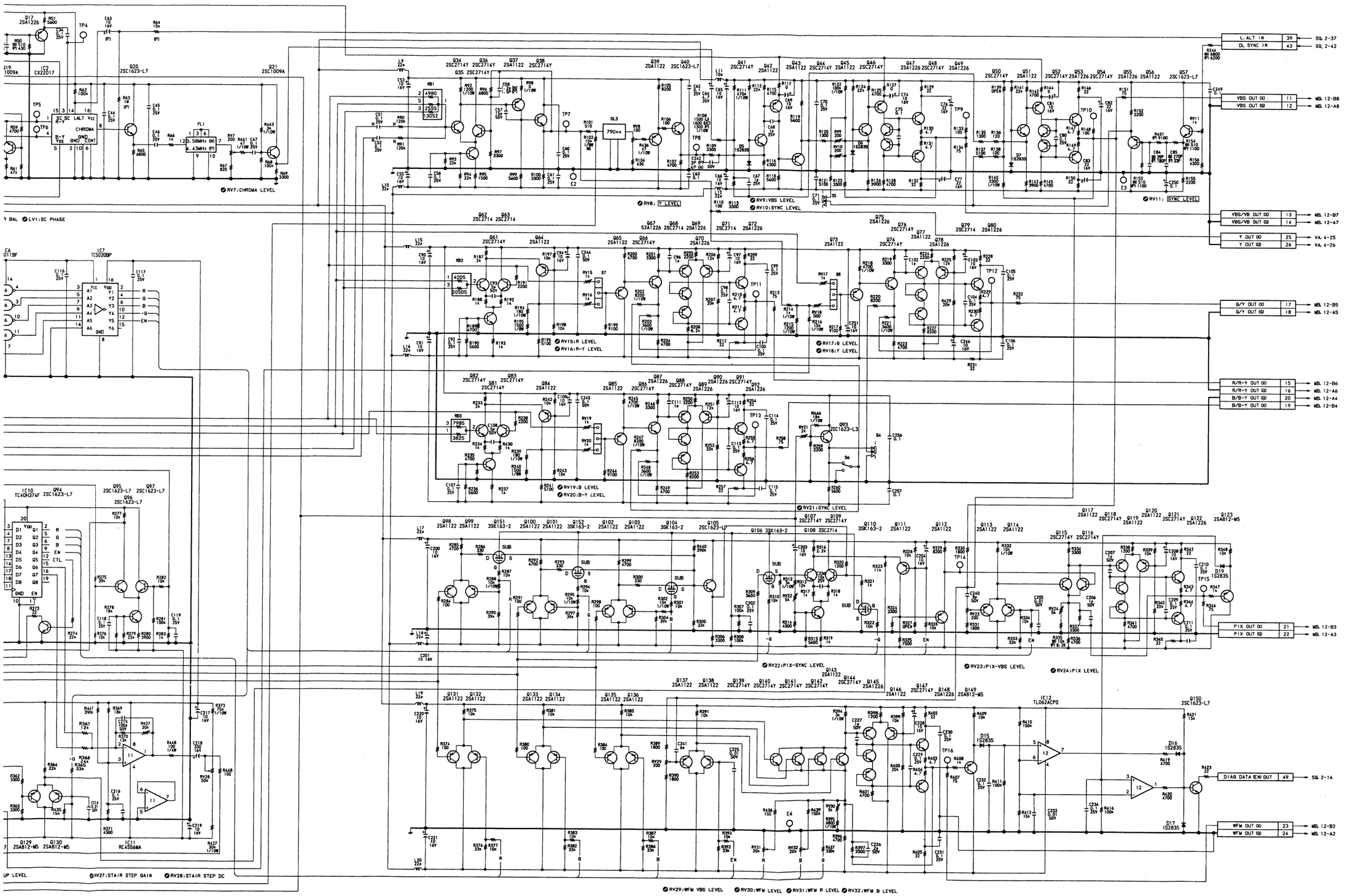
EN-64 1-624-106-12

CN1	A-4	L1	C-1	Q1	B-1	Q61	D-3	Q121	H-3	RV26	C-4
CN19	B-4	L2	C-1	Q2	A-1	Q62	D-2	Q122	H-3	RV27	D-4
		L3	E-1	Q3	C-1	Q63	D-2	Q123	H-3	RV28	D-4
D1	B-1	L4	G-1	Q4	D-1	Q64	D-2	Q124	B-4	RV29	E-4
D2	B-1	L5	G-1	Q5	D-1	Q65	E-3	Q125	C-4	RV30	F-4
D3	B-1	L6	G-1	Q6	D-1	Q66	E-2	Q126	B-4	RV31	E-3
D4	C-1	L7	C-2	Q7	D-1	Q67	E-2	Q127	C-3	RV32	F-3
D5	H-2	L8	C-2	Q8	D-1	Q68	E-2	Q128	C-3		
D6	H-3	L9	C-1	Q9	D-1	Q69	E-3	Q129	C-4	S1	D-1
D7	H-4	L10	C-2	Q10	E-1	Q70	E-2	Q130	C-4	S2	F-1
D8	B-3	L11	H-1	Q11	E-1	Q71	E-2	Q131	D-4	S3	B-2
D9	B-3	L12	G-1	Q12	E-1	Q72	E-3	Q132	D-4	S4	F-2
D10	A-3	L14	C-1	Q13	G-1	Q73	E-2	Q133	E-4	S5	H-3
D11	B-3	L15	C-2	Q14	G-1	Q74	E-1	Q134	E-4	S6	F-2
D12	B-3	L16	C-3	Q15	G-1	Q75	E-1	Q135	E-4	S7	D-3
D13	A-3	L17	C-3	Q16	G-1	Q76	E-2	Q136	E-4	S8	E-2
D14	B-3	L18	C-3	Q17	H-1	Q77	E-2	Q137	E-4	S9	F-3
D15	G-4	L19	E-4	Q18	H-1	Q78	F-1	Q138	E-4		
D16	G-4	L20	E-4	Q19	H-1	Q79	F-2	Q139	F-4	TP1	C-1
D17	G-4	L22	A-1	Q20	H-1	Q80	F-2	Q140	E-4	TP2	C-1
D19	H-3	L23	A-1	Q21	H-1	Q81	F-3	Q141	E-4	TP3	D-3
				Q22	B-2	Q82	F-2	Q142	E-4	TP4	H-1
DL3	H-2	LV1	H-1	Q23	B-1	Q83	F-2	Q143	F-4	TP5	H-1
		LV2	C-4	Q24	B-2	Q84	F-2	Q144	F-4	TP6	I-1
E1	C-1	LV3	H-4	Q25	B-1	Q85	G-3	Q145	F-4	TP7	D-2
E2	E-1			Q26	A-2	Q86	G-2	Q146	F-4	TP8	H-2
E3	E-3			Q27	A-1	Q87	G-2	Q147	F-4	TP9	I-3
E4	E-3			Q28	C-1	Q88	G-2	Q148	F-4	TP10	I-3
				Q29	C-2	Q89	G-3	Q149	G-4	TP11	E-2
FL1	I-1			Q30	C-1	Q90	G-2	Q150	G-4	TP12	F-2
				Q31	C-2	Q91	G-2	Q151	D-3	TP13	G-2
IC1	B-1			Q32	B-1	Q92	G-3	Q152	D-3	TP14	G-3
IC2	H-1			Q33	B-2	Q93	G-2			TP15	H-3
IC4	B-2			Q34	D-2	Q94	B-4	RB1	C-2	TP16	G-4
IC5	B-3			Q35	D-2	Q95	B-4	RB2	C-2	TP17	C-2
IC6	C-2			Q36	D-1	Q96	B-4	RB3	D-2	TP18	C-2
IC7	C-4			Q37	D-2	Q97	A-4	RB4 (P)	C-1	TP19	C-2
IC8	B-3			Q38	D-2	Q98	D-3	RB5 (N)	C-1		
IC10	B-4			Q39	H-2	Q99	D-3	RB6	C-1		
IC11	D-4			Q40	H-2	Q100	D-3				
IC12	G-4			Q41	H-2	Q101	D-3	RV1	B-1		
				Q42	H-2	Q102	E-3	RV3	G-1		
				Q43	H-2	Q103	E-3	RV4	G-1		
				Q44	H-3	Q104	E-3	RV5	I-2		
				Q45	H-3	Q105	E-3	RV6	I-3		
				Q46	H-3	Q106	D-3	RV7	I-2		
				Q47	H-3	Q107	D-3	RV8	I-2		
				Q48	I-3	Q108	D-3	RV9	I-2		
				Q49	H-3	Q109	C-3	RV10	H-2		
				Q50	H-4	Q110	C-3	RV11	I-4		
				Q51	I-4	Q111	C-3	RV12	B-3		
				Q52	H-4	Q112	C-3	RV13	B-3		
				Q53	H-4	Q113	B-3	RV14	B-3		
				Q54	I-4	Q114	B-3	RV15	D-3		
				Q55	H-4	Q115	B-3	RV16	D-2		
				Q56	H-3	Q116	B-3	RV17	E-2		
				Q57	H-4	Q117	B-4	RV18	E-2		
				Q58	C-2	Q118	B-4	RV19	F-3		
				Q59	B-2	Q119	B-4	RV20	F-2		
				Q60	B-2	Q120	H-3	RV21	G-2		
								RV22	F-3		
								RV23	G-3		
								RV24	G-3		
								RV25	C-4		

3	EN-64/64P	EN-64/64P	3

EN-64/EN64P BOARD: ENCODER


SG. 2-39 40 SC IN 00
SG. 2-38 41 SC IN 60
3 REG (+9.5V) IN
1 GND
2 GND
53 GND
4 REG (-5.5V) IN
SG. 2-41 42 BF IN
AT. 1-45 31 PIX SEL A IN
AT. 1-44 30 PIX SEL B IN
AT. 1-43 29 PIX SEL C IN
AT. 1-42 28 PIX SEL D IN
MB. 8-B1/7-B1 38 SEQ SYNC IN (Y)
MB. 8-A2/7-A2 37 SEQ SYNC IN 00
VA. 4-5 5 R IN 00
VA. 4-6 6 R IN 60
VA. 4-7 7 G IN 00
VA. 4-8 8 G IN 60
VA. 4-9 9 B IN 00
VA. 4-10 10 B IN 60
AT. 1-28 27 BAR CONT IN
SG. 2-45 46 BAR CK IN 60
SG. 2-44 45 BAR CK IN 00
SG. 2-46 47 HD IN
SG. 2-32 36 VD IN
AT. 1-49 35 WFM SEL A IN
AT. 1-48 34 WFM SEL B IN
AT. 1-47 33 WFM SEL C IN
AT. 1-46 32 WFM SEL D IN
MB. 13-B2 50 SEQ CONT IN
SG. 2-47 48 BLKG IN
SG. 2-43 44 SYNC IN
MB. 13-B1 51 STAIR CASE IN
52 REQ (+24V) IN
RV1:+5V ADJ
RV2:BURST LEVEL
RV3:BURST PHASE
RV4:Q/U GAIN
RV5:Q/U CARRIER BAL
RV6:I/V CARRIER BAL
LV1:SC PHASE
RV12:R LEVEL
RV13:G LEVEL
RV14:B LEVEL
LV2:SYNC PHASE
RV25:VBS-SETUP LEVEL
RV26:Y-SETUP LEVEL
RV27:STAIR STEP
SC SC LAT Vcc
CHROMA
B-Y
R-Y
GND CONT
IC1 TL064CMS
IC2 CX22017
IC4 CX7968A
IC5 MC14001BF
IC6 MC4011BF
IC7 TC5020BP
IC8 MC14013BF
IC9 HN17C649-20
IC10 TC40H374F
IC11 RC4556MA

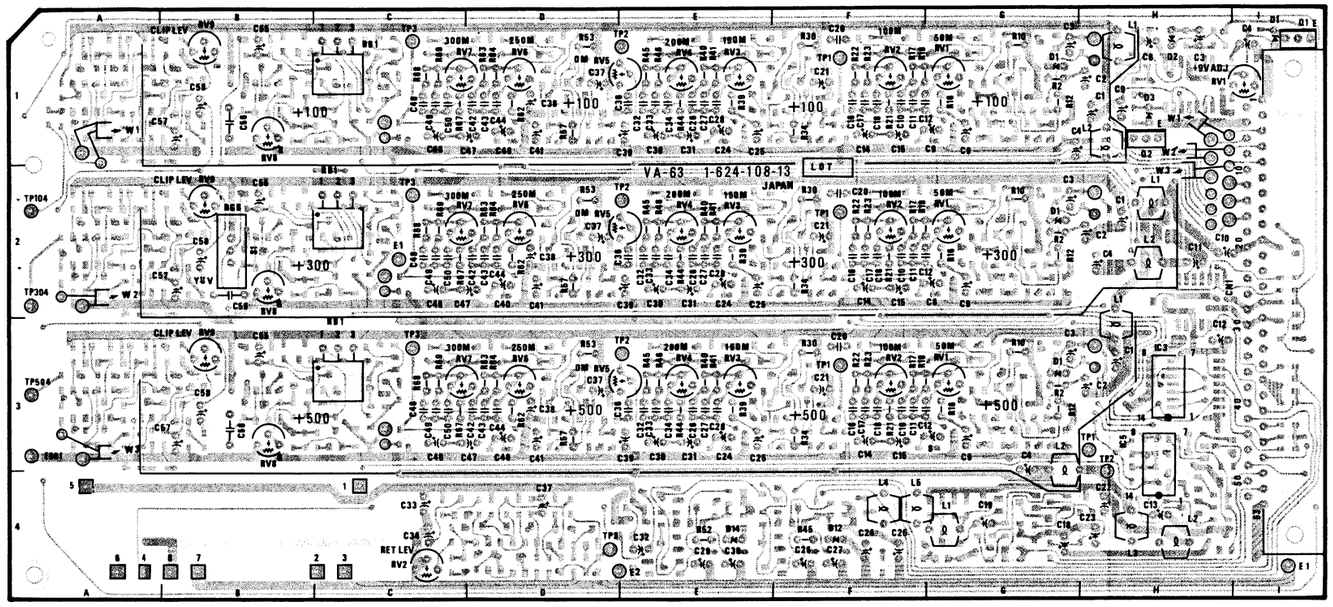

L.ALT IN 39 → SQ. 2-37
DL SYNC IN 43 → SQ. 2-42
VBS OUT 00 11 → MBL 12-B8
VBS OUT 01 12 → MBL 12-A8
VBS/YB OUT 00 13 → MBL 12-B7
VBS/YB OUT 01 14 → MBL 12-A7
Y OUT 00 25 → VA. 4-25
Y OUT 01 26 → VA. 4-26
G/Y OUT 00 17 → MBL 12-B5
G/Y OUT 01 18 → MBL 12-A5
R/R-Y OUT 00 15 → MBL 12-B6
R/R-Y OUT 01 16 → MBL 12-A6
B/B-Y OUT 00 19 → MBL 12-B4
B/B-Y OUT 01 20 → MBL 12-A4
PIX OUT 00 21 → MBL 12-B3
PIX OUT 01 22 → MBL 12-A3
DIAG DATA (EN) OUT 49 → SQL 2-14
WFM OUT 00 23 → MBL 12-B2
WFM OUT 01 24 → MBL 12-A2
RV7:CHROMA LEVEL
RV8: Y LEVEL
RV9:VBS LEVEL
RV10:SYNC LEVEL
RV11: SYNC LEVEL
RV15:R LEVEL
RV16:R-Y LEVEL
RV17:G LEVEL
RV18:Y LEVEL
RV19:B LEVEL
RV20:B-Y LEVEL
RV21:SYNC LEVEL
RV22:PIX-SYNC LEVEL
RV23:PIX-VBS LEVEL
RV24:PIX LEVEL
RV27:STAIR STEP GAIN
RV28:STAIR STEP DC
RV29:WFM VBS LEVEL
RV30:WFM LEVEL
RV31:WFM R LEVEL
RV32:WFM B LEVEL

CCU-350 (UC) (J)
CCU-350P (EK)

B-CCU350-EN64M803

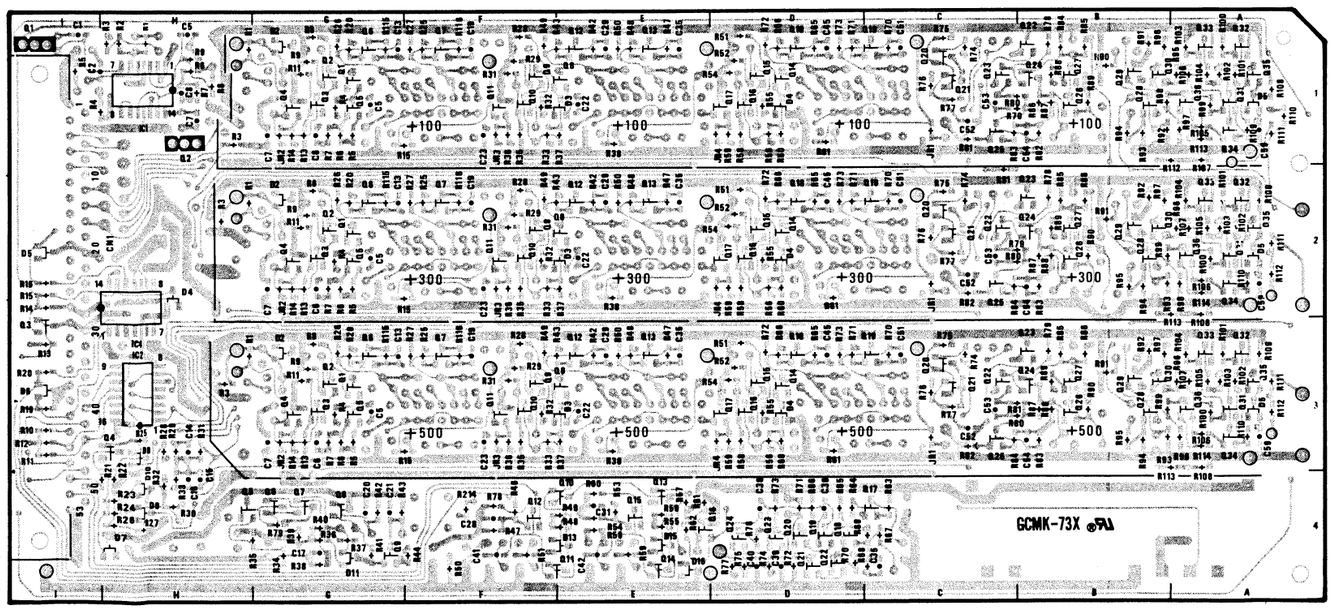
VA-63 BOARD

COMPONENT SIDE



1-624-108-13

SOLDERING SIDE



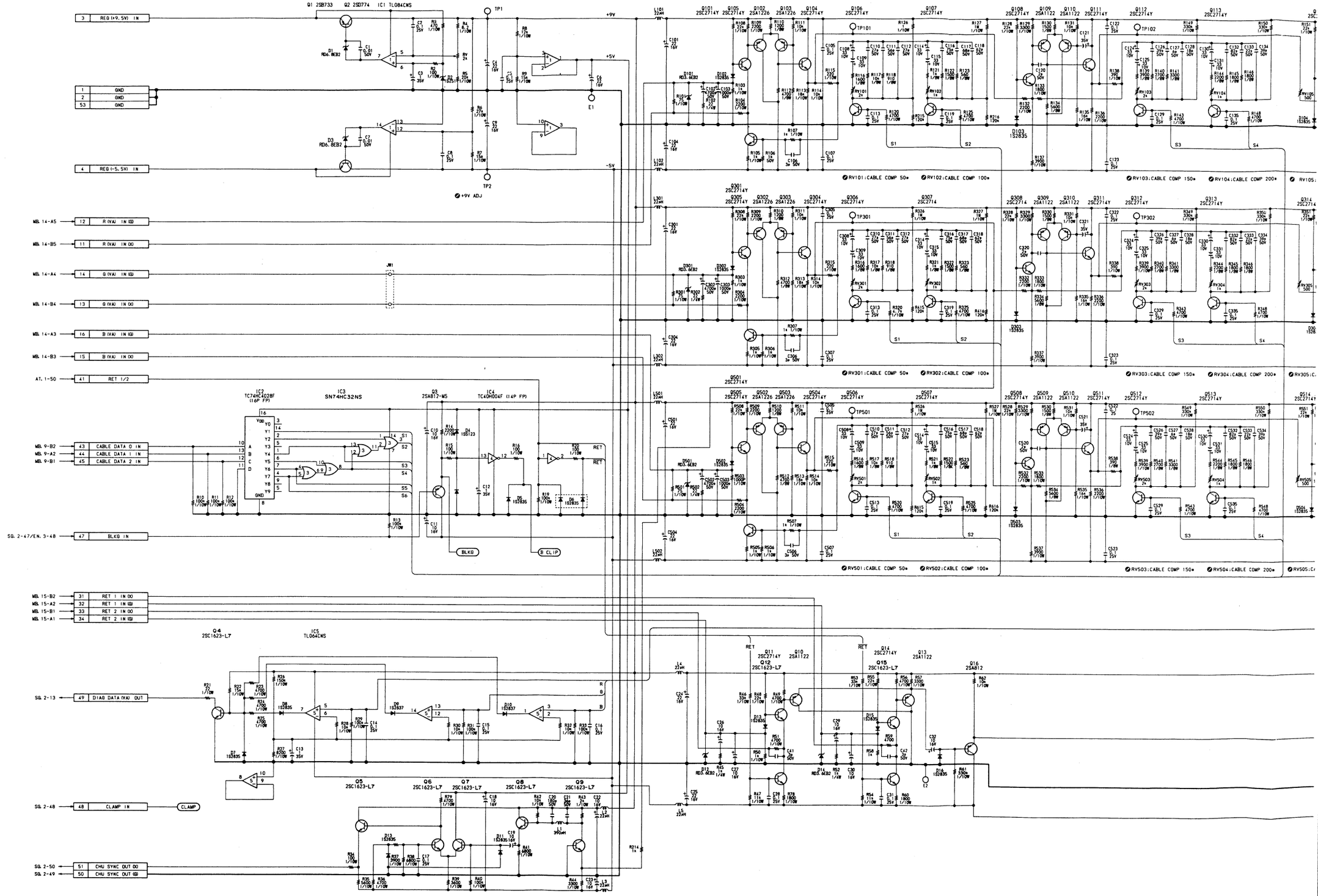
1-624-108-13

VA-63 1-624-108-13

CN1	H-2	RV1	H-1	TP1	H-3
		RV2	C-4	TP2	H-3
D1	I-1	RV101	G-1	TP3	D-4
D2	H-1	RV102	F-1	TP101	F-1
D3	H-1	RV103	E-1	TP102	E-1
D12	F-4	RV104	E-1	TP103	C-1
D14	E-4	RV105	D-1	TP104	A-2
D101	G-1	RV106	D-1	TP301	F-2
D301	G-2	RV107	C-1	TP302	E-2
D501	G-3	RV108	B-1	TP303	C-2
		RV109	B-1	TP304	A-2
E1	I-4	RV301	G-2	TP501	F-3
E2	E-4	RV302	F-2	TP502	E-3
E301	C-2	RV303	E-2	TP503	C-3
E501	A-3	RV304	E-2	TP504	A-3
		RV305	D-2		
IC3	H-3	RV306	D-2	W1	A-1
IC5	H-3	RV307	C-2	W2	A-2
		RV308	B-2	W3	A-3
L1	G-4	RV309	B-2	W101	H-1
L2	H-4	RV501	G-3	W102	H-1
L3	H-4	RV502	F-3	W303	H-2
L4	F-4	RV503	E-3		
L5	F-4	RV504	E-3		
L101	H-1	RV505	D-3		
L102	H-1	RV506	D-3		
L301	H-2	RV507	C-3		
L302	H-2	RV508	B-3		
L501	H-3	RV509	B-3		
L502	G-3				
Q1	I-1				
Q2	I-1				
RB101	C-1				
RB301	C-2				
RB501	C-3				

4	VA-63	VA-63	4

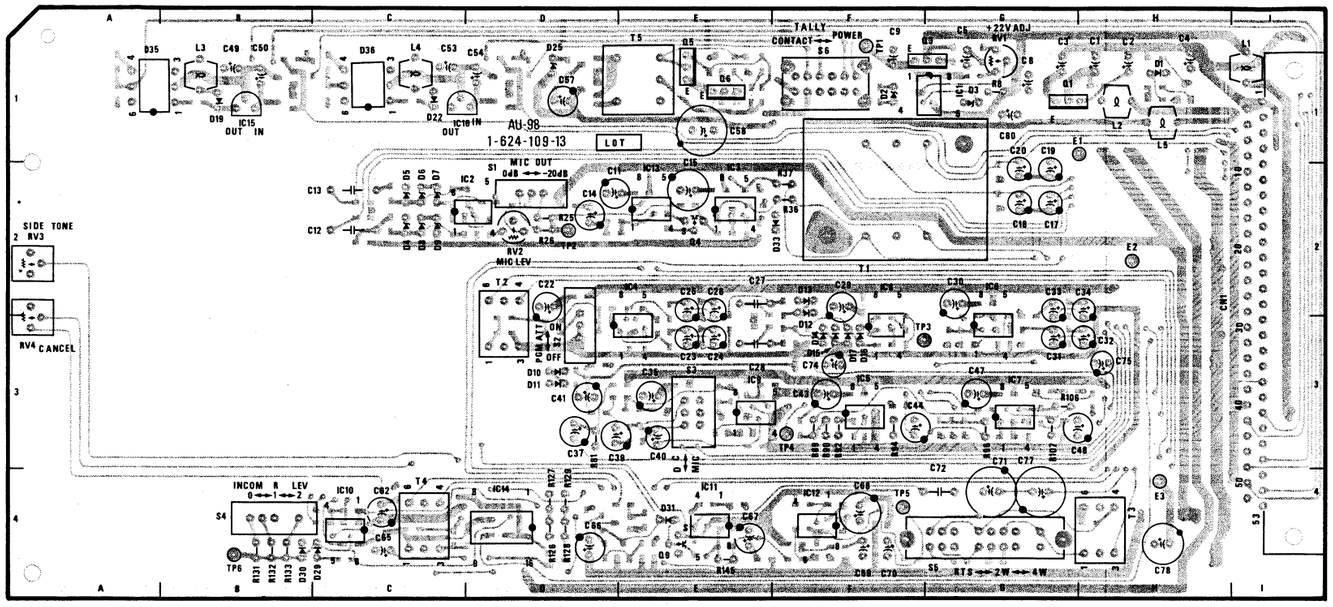
VA-63 BOARD: R/G/B VIDEO CABLE COMPENSATOR



Q113 2SC2714Y
Q114 2SC2714Y
Q115 2SA1122
Q116 2SA1122
Q117 2SC2714Y
Q118 2SC2714Y
Q119 2SC2714Y
Q120 2SA1122
Q121 2SA1122
Q122 2SC2714Y
Q125 2SC2714Y
Q123 2SC2714Y
Q124 2SA1122
Q126 2SC2714Y
Q127 2SC2714Y
Q128 2SC1009A
Q129 2SA1122
Q130 2SA1122
Q131 2SC2714Y
Q132 2SA812
Q133 2SA812
Q134 2SC2714Y
Q136 2SA1122
Q135 2SA812
TP103
TP104
JW101
RS101 JR
PB101 3K 4203
RV104:CABLE COMP 200*
RV105:CABLE COMP 0*
RV106:CABLE COMP 250*
RV107:CABLE COMP 300*
RV108:R VIDEO LEVEL
RV109:CLIP LEVEL
R OUT (X) 5
R OUT (G) 6
EN. 3-5
EN. 3-6
Q313 2SC2714Y
Q314 2SC2714
Q315 2SA1122
Q316 2SA1122
Q317 2SC2714Y
Q318 2SC2714Y
Q319 2SC2714Y
Q320 2SA1122
Q321 2SA1122
Q322 2SA812
Q325 2SC2714Y
Q324 2SA1226
Q323 2SA812
Q326 2SC2714Y
Q327 2SC2714Y
Q328 2SC1009A
Q329 2SA1122
Q330 2SA1122
Q331 2SC2714Y
Q332 2SA812
Q333 2SA812
Q334 2SC2714Y
Q336 2SA1122
Q335 2SA812
TP303
TP304
JW301
RS301 JR
PB301 3K 6222
RGB
YUV
S301
RV304:CABLE COMP 200*
RV305:CABLE COMP 0*
RV306:CABLE COMP 250*
RV307:CABLE COMP 300*
RV308:G VIDEO LEVEL
RV309:CLIP LEVEL
G OUT (X) 7
G OUT (G) 8
EN. 3-7
EN. 3-8
E301
Q513 2SC2714Y
Q514 2SC2714Y
Q515 2SA1226
Q516 2SA1226
Q517 2SC2714Y
Q518 2SC2714Y
Q519 2SC2714Y
Q520 2SA1122
Q521 2SA1122
Q522 2SC2714Y
Q525 2SC2714Y
Q524 2SA1122
Q523 2SC2714Y
Q526 2SC2714
Q527 2SC2714
Q528 2SC1009A
Q529 2SA1122
Q530 2SA1122
Q531 2SC2714Y
Q532 2SA812
Q533 2SA812
Q534 2SC2714Y
Q536 2SA1122
Q535 2SA812
TP503
TP504
JW501
RS501 JR
PB501 3K 5361
RV504:CABLE COMP 200*
RV505:CABLE COMP 0*
RV506:CABLE COMP 250*
RV507:CABLE COMP 300*
RV508:B VIDEO LINE
RV509:CLIP LEVEL
CLAMP
BLKG
B CLIP
B OUT (X) 9
B OUT (G) 10
EN. 3-9
EN. 3-10
E501
Q19 2SA1122
Q17 2SA812
Q18 2SC2714Y
Q21 2SC2714Y
Q22 2SA1226
Q20 2SA1122
Q23 2SC2714Y
Q24 2SA1126
TP3
RV4:RET LEVEL
RET OUT (X) 21
RET OUT (G) 22
MEB. 14-B1
MEB. 14-A1

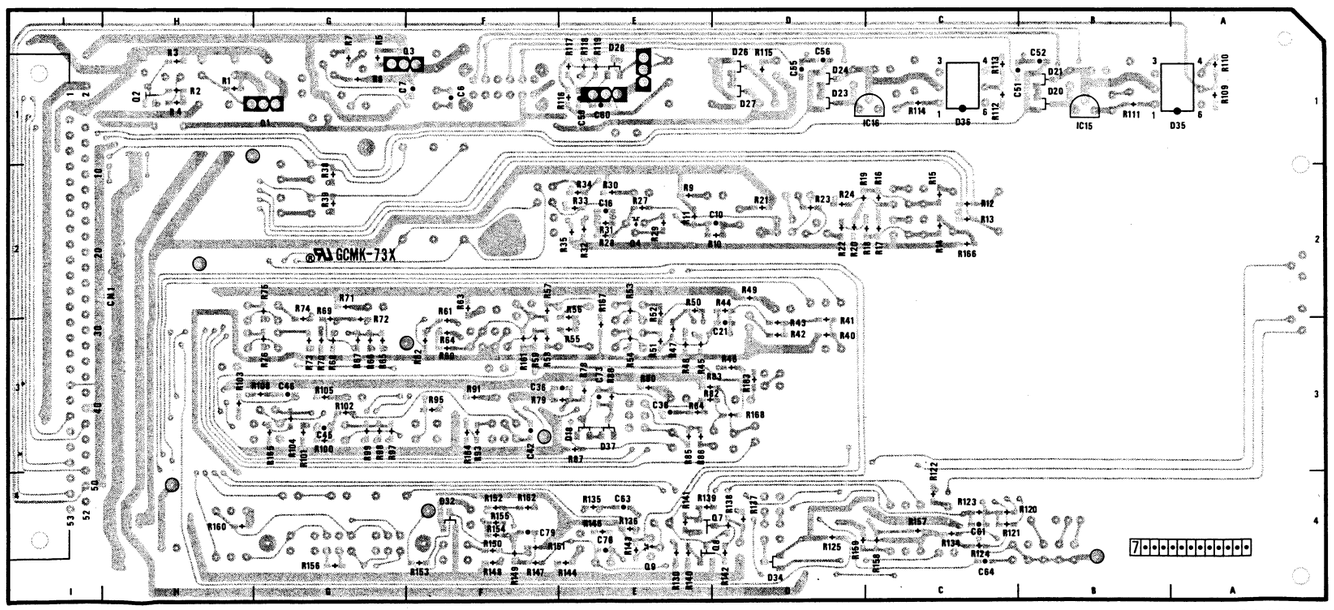
AU-98 BOARD

COMPONENT SIDE



1-624-109-13

SOLDERING SIDE



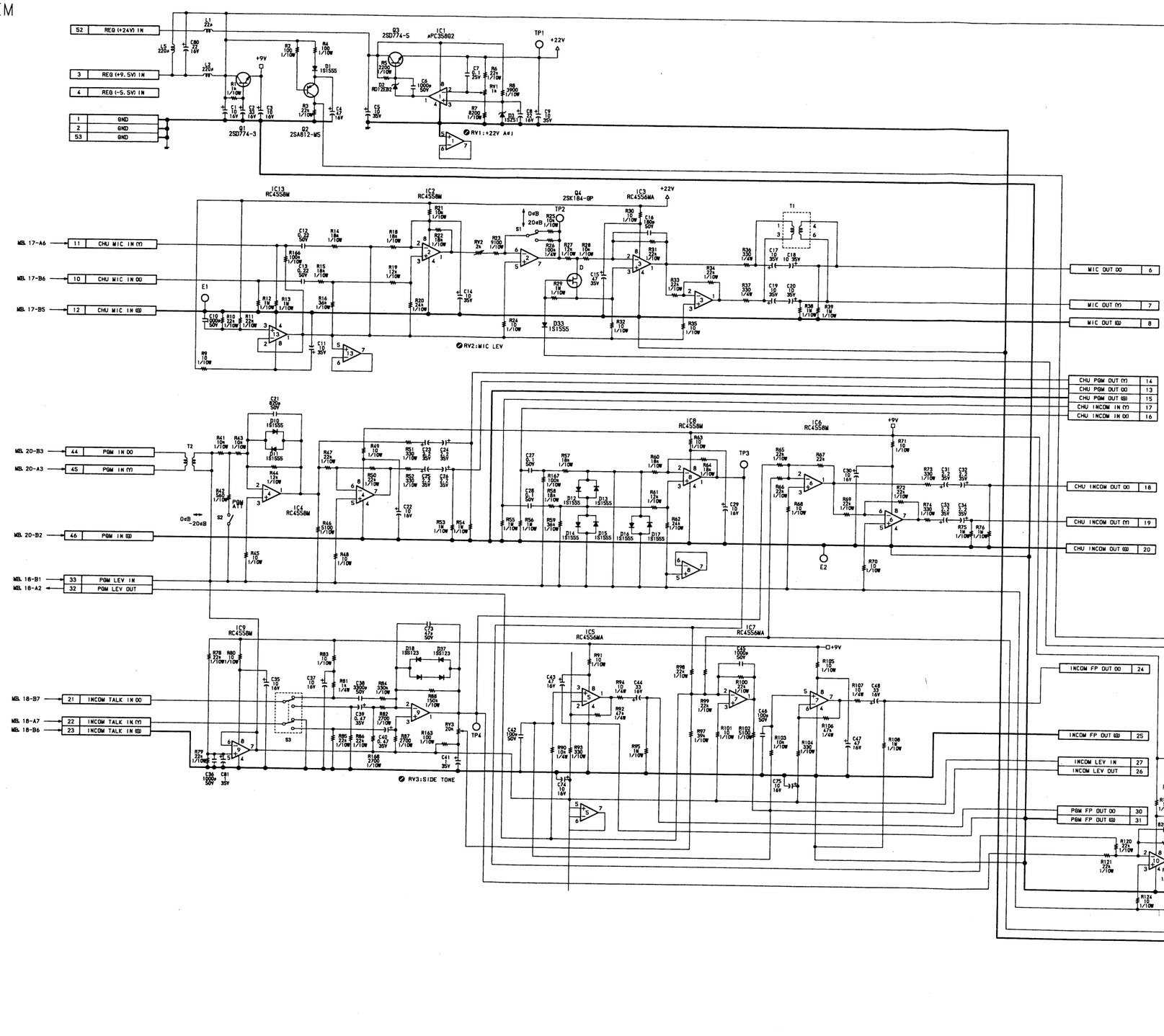
1-624-109-13

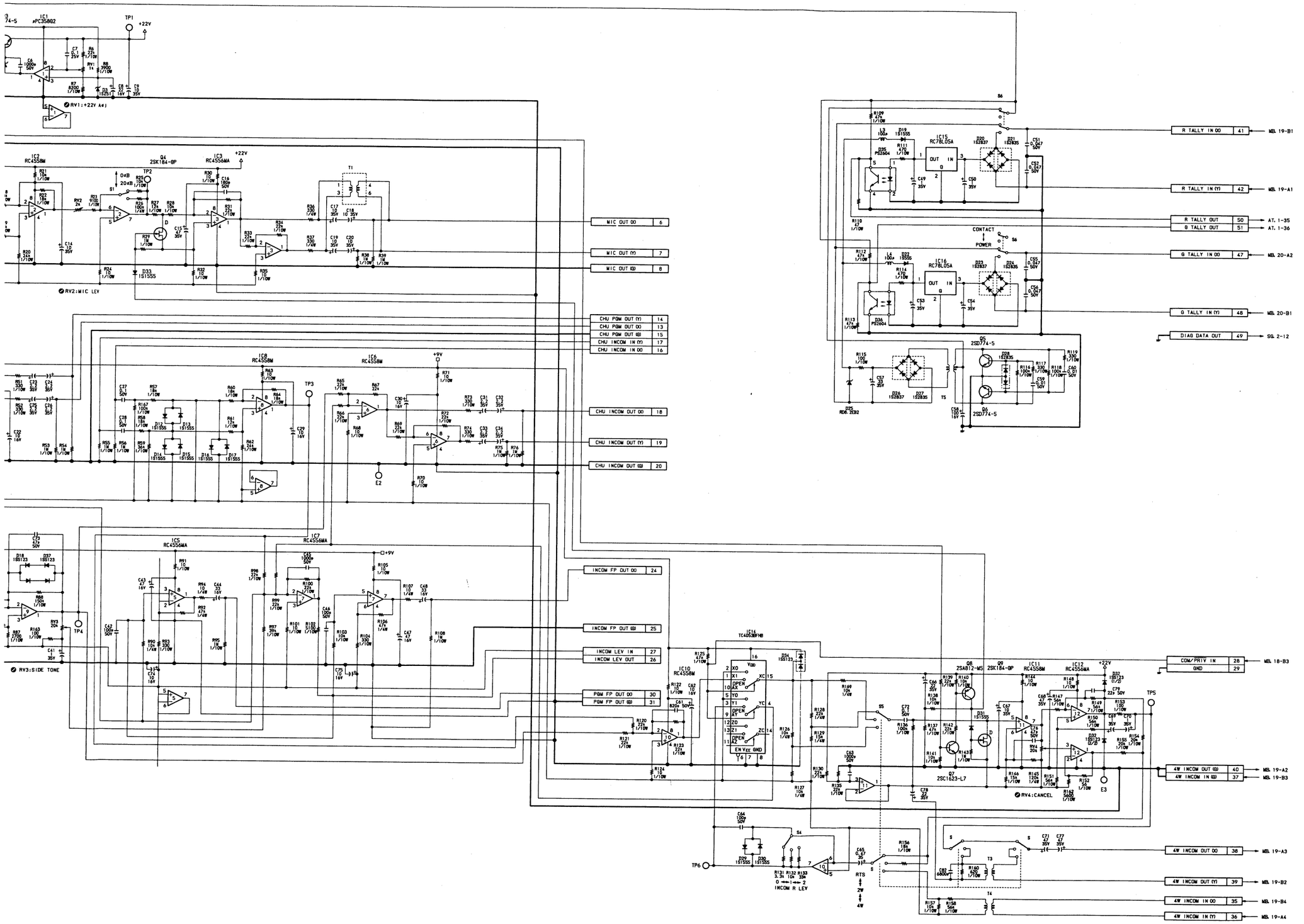
AU-98 1-624-109-13

CN1	H-2	Q1	G-1
		Q2	H-1
D1	H-1	Q3	F-1
D2	F-1	Q4	E-2
D3	G-1	Q5	E-1
D10	D-3	Q6	E-1
D11	D-3	Q7	D-4
D12	F-3	Q8	D-4
D13	F-2	Q9	E-4
D14	F-3		
D15	F-3	RV1	G-1
D16	F-3	RV2	D-2
D17	F-3	RV3	A-2
D18	E-3	RV4	A-3
D19	B-1		
D20	B-1		
D21	B-1	S1	D-2
D22	C-1	S2	D-3
D23	D-1	S3	E-3
D24	D-1	S4	B-4
D25	D-1	S5	G-4
D26	D-1	S6	F-1
D27	D-1		
D28	E-1	T2	D-2
D29	C-4	T3	H-4
D30	B-4	T4	C-4
D31	E-4	T5	E-1
D32	F-4		
D33	F-2	TP1	F-1
D34	D-4	TP2	D-2
D35	A-1	TP3	F-3
D36	C-1	TP4	F-3
D37	E-3	TP5	F-4
		TP6	B-4
E1	H-1		
E2	H-2		
E3	H-4		
IC1	G-1		
IC2	D-2		
IC3	E-2		
IC4	E-2		
IC5	F-3		
IC6	G-2		
IC7	G-3		
IC8	F-2		
IC9	E-3		
IC10	C-4		
IC11	E-4		
IC12	F-4		
IC13	E-2		
IC14	D-4		
IC15	B-1		
IC16	C-1		
L1	I-1		
L2	H-1		
L3	B-1		
L4	C-1		
L5	H-1		

5	AU-98	AU-98	5

AU-98 BOARD: PGM AND INCOM SYSTEM





CCU-355 (UC) (J)
CCU-355P (EK)
CCU-350 (UC) (J)
CCU-350P (EK)

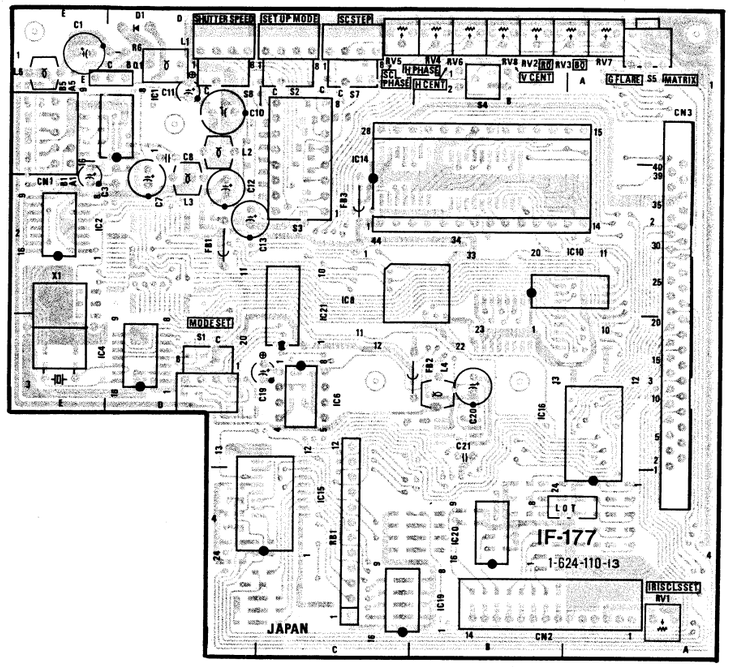
B-CCU350-AU98M710

FRAME(1/2)

IF-177 BOARD
CP-120 BOARD
SW-225 BOARD
SW-242 BOARD
SW-266 BOARD

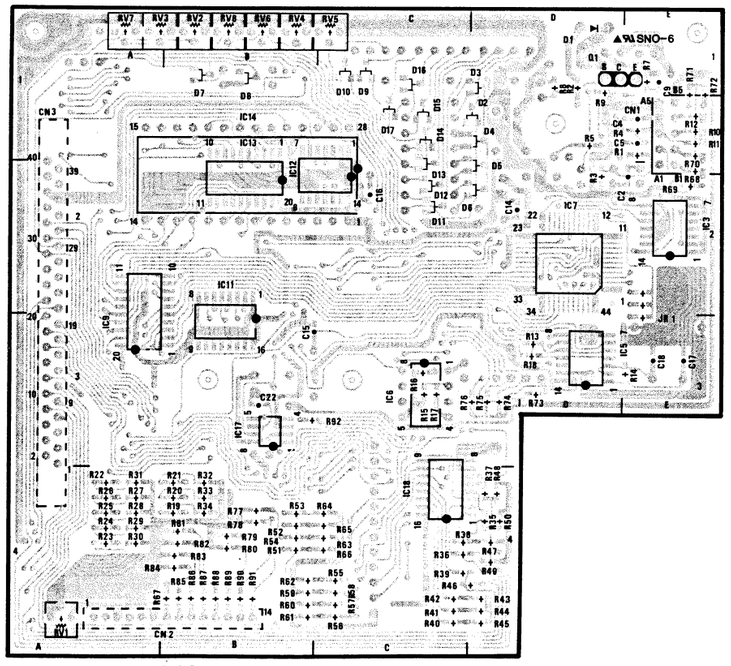
IF-177 BOARD

COMPONENT SIDE



1-624-110-13

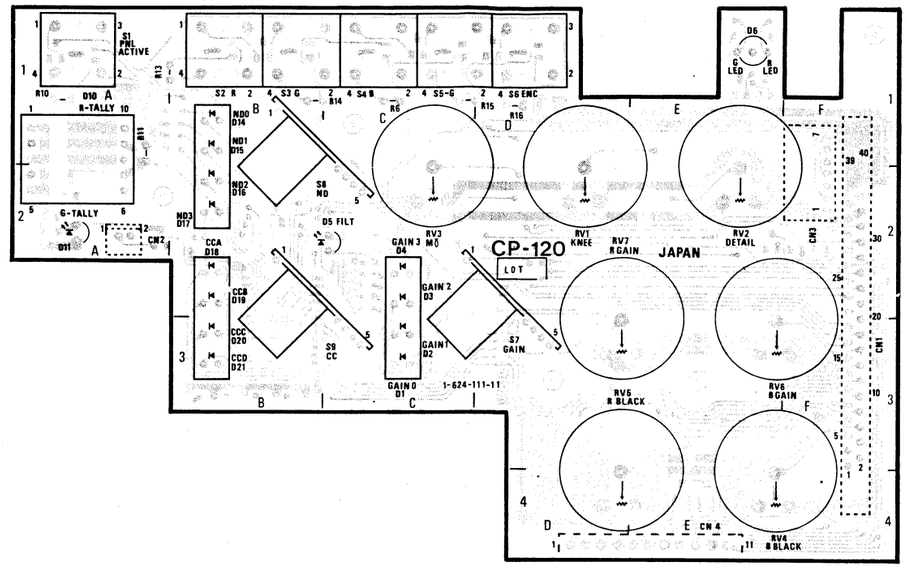
SOLDERING SIDE



FRAME (1/2)

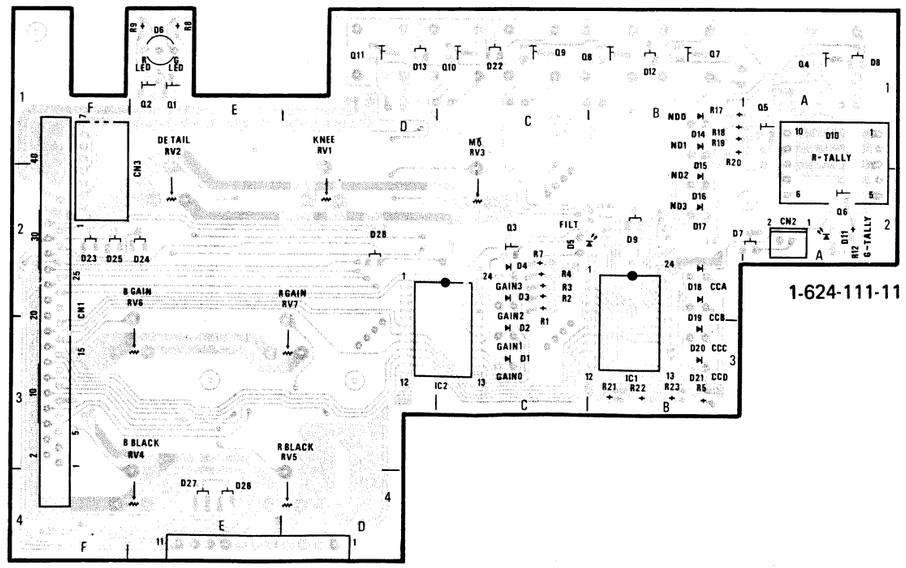
CP-120 BOARD

COMPONENT SIDE



1-624-111-11

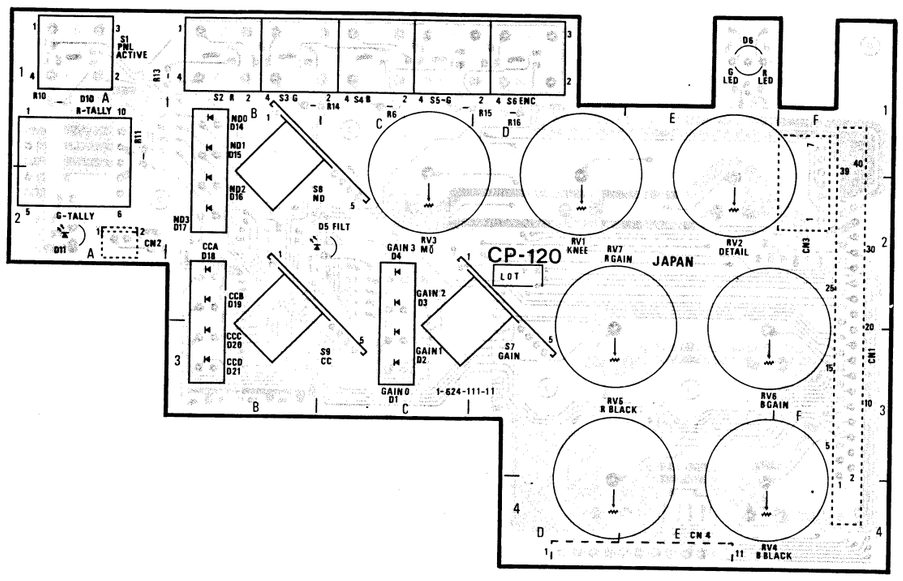
SOLDERING SIDE



FRAME (1/2) IF-177, CP-120, SW-225
SW-242, SW-266

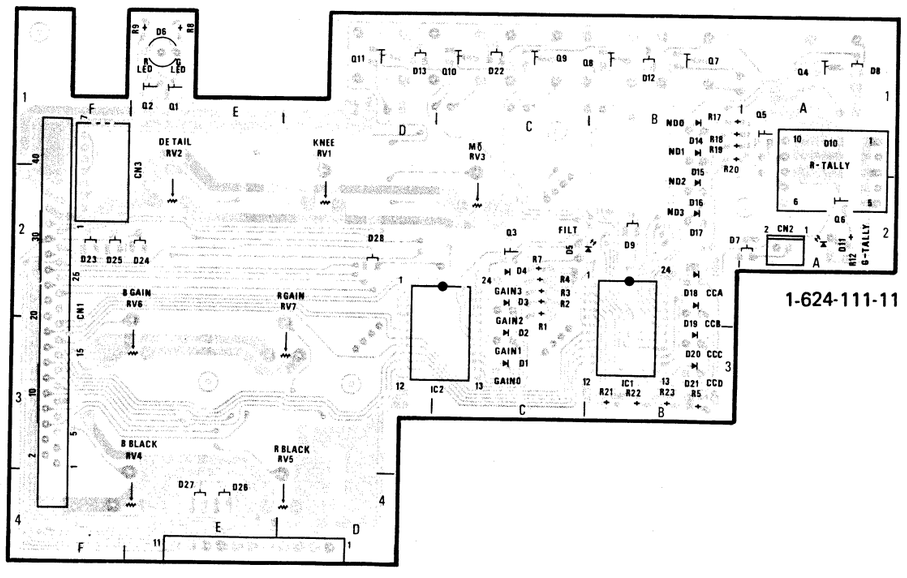
CP-120 BOARD

COMPONENT SIDE



1-624-111-11

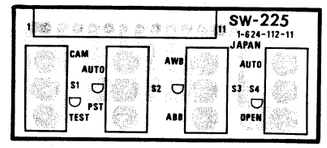
SOLDERING SIDE



1-624-111-11

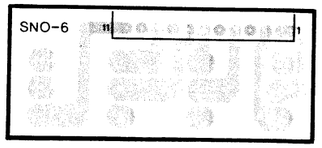
SW-225 BOARD

COMPONENT SIDE



1-624-112-11

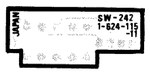
SOLDERING SIDE



1-624-112-11

SW-242 BOARD

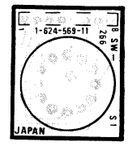
COMPONENT SIDE



1-624-115-11

SW-266 BOARD

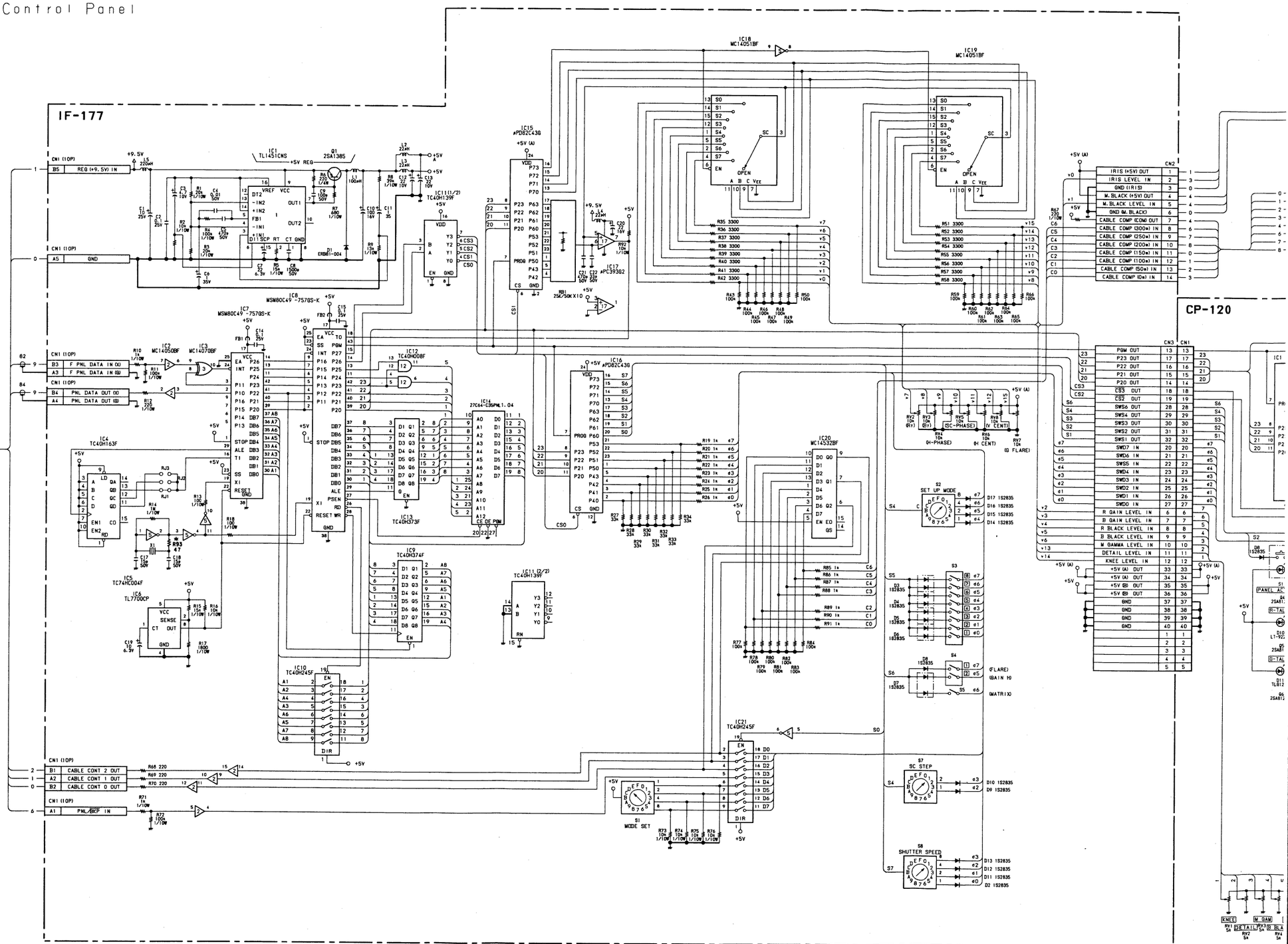
COMPONENT SIDE



1-624-569-11

FRAME (1/2) CP-120 SW-225 SW-266
IF-177 SW-242

CP-120 BOARD : Control Panel
IF-177 BOARD : Interface for Control Panel
SW-225 BOARD : Switch board
SW-242 BOARD : Switch board
SW-266 BOARD : Switch board



CCU-355 (UC) (J)
CCU-355P (EK)
CCU-350 (UC) (J)
CCU-350P (EK)

CP-120 SW-225 SW-266
IF-177 SW-242

FRAME (1/2)

NOTE

MARK	Ref.	Description	Serial Number
*	R93	47	CCU-350(J) 13801- CCU-350(UC) 25201- CCU-350P(EK) 36001-

SW-266

CP-120

SW-225

SW-242

SW-242

SW-242

CCU-350 (UC) (J)
CCU-350P (EK)

FRAME (2/2)

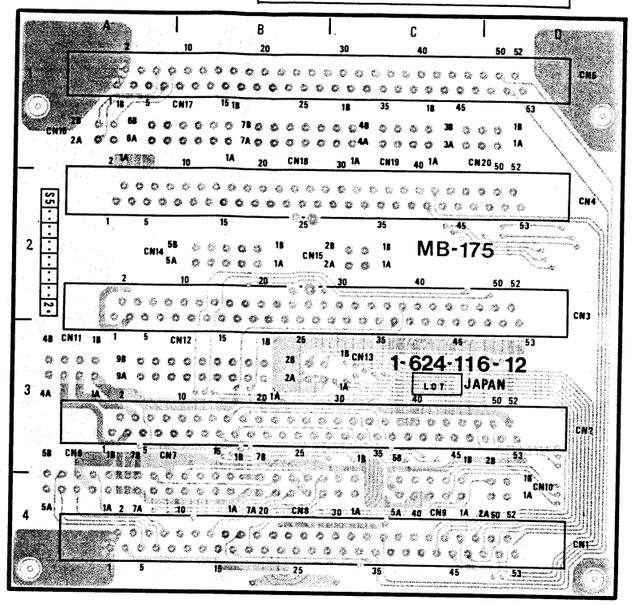
FRAME (2/2)

MB-175 BOARD
CN-244 BOARD

MB-175 BOARD

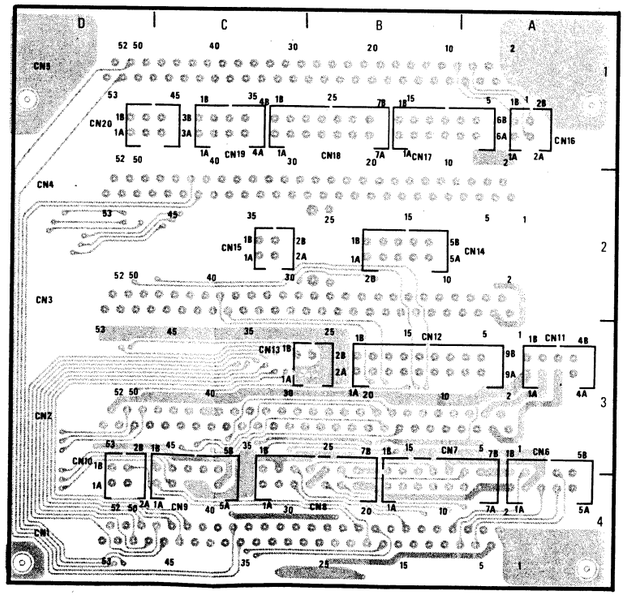
COMPONENT SIDE

Serial No. 10201 and higher (J)
20201 and higher (UC)
30301 and higher (EK)



1-624-114-12

SOLDERING SIDE



1-624-114-12

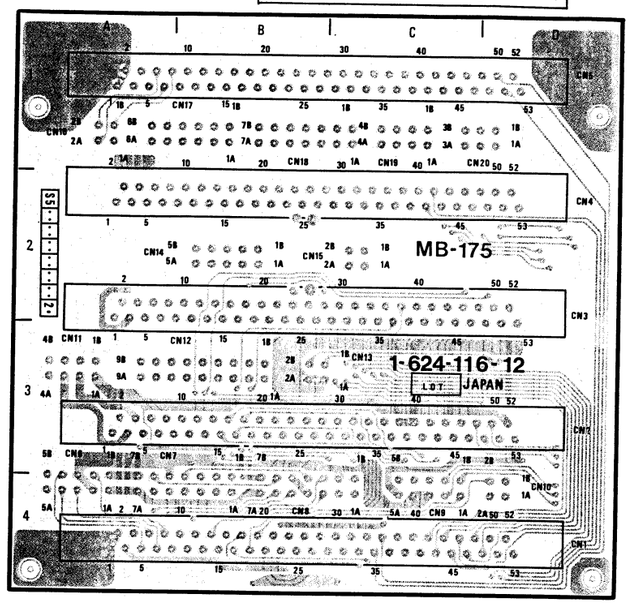
FRAME (2/2) MB-175
CN-244

FRAME (2/2)

MB-175 BOARD
CN-244 BOARD

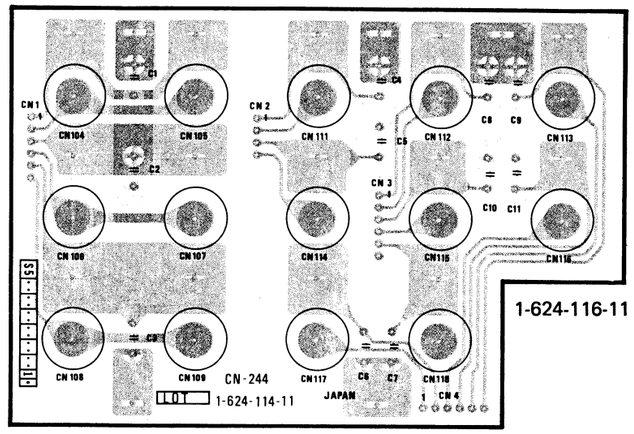
MB-175 BOARD
COMPONENT SIDE

Serial No. 10201 and higher (J)
20201 and higher (UC)
30301 and higher (EK)



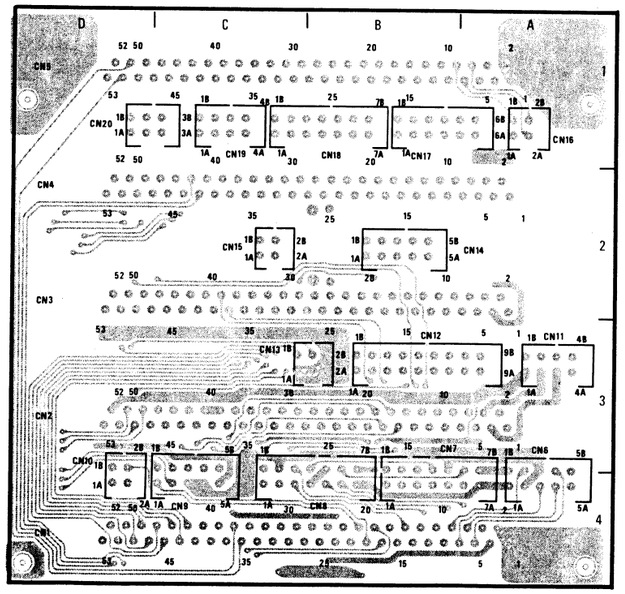
1-624-114-12

CN-244 BOARD
COMPONENT SIDE



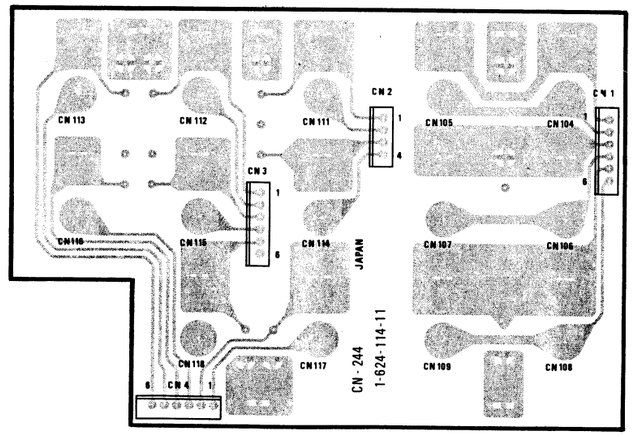
1-624-116-11

SOLDERING SIDE



1-624-114-12

SOLDERING SIDE

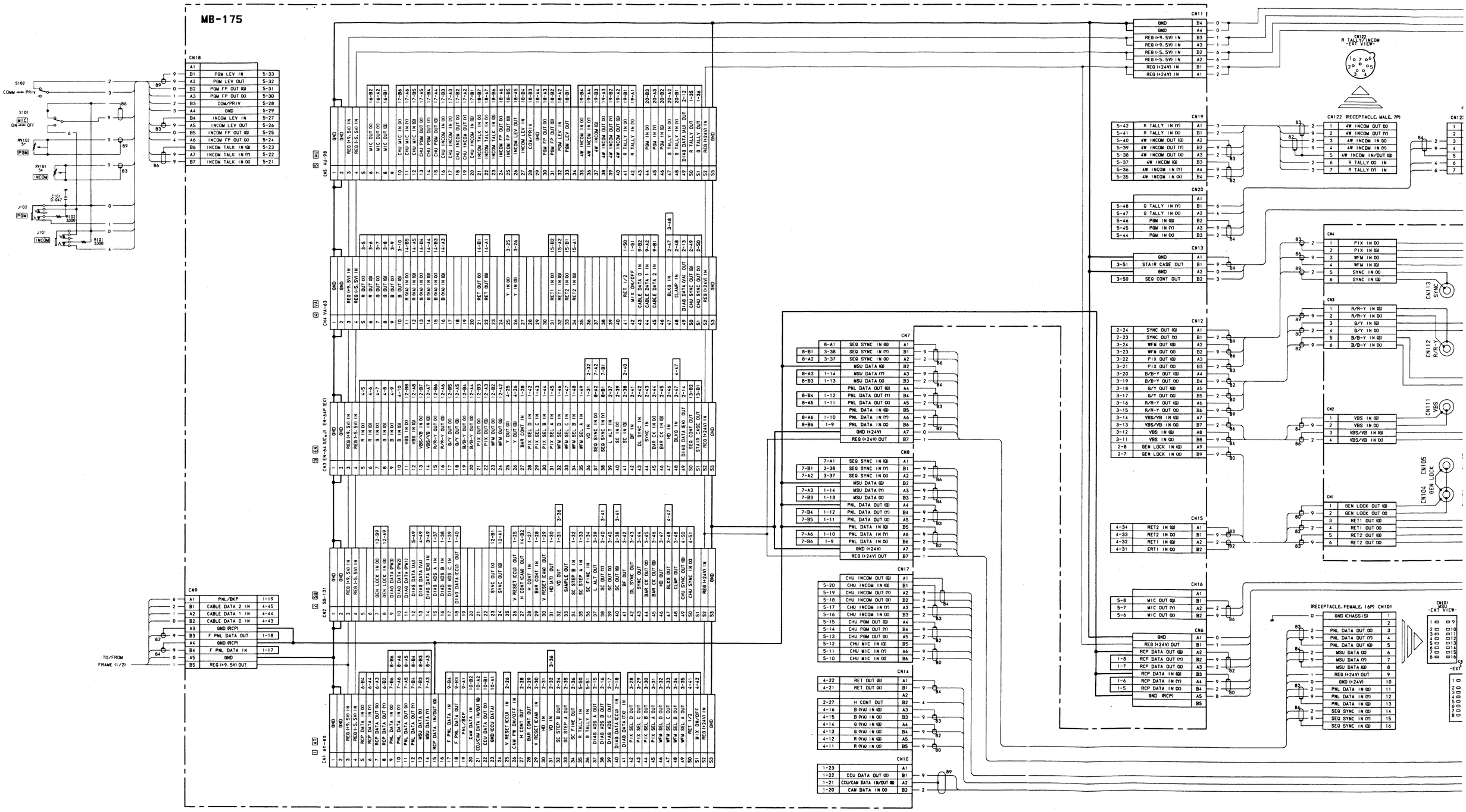


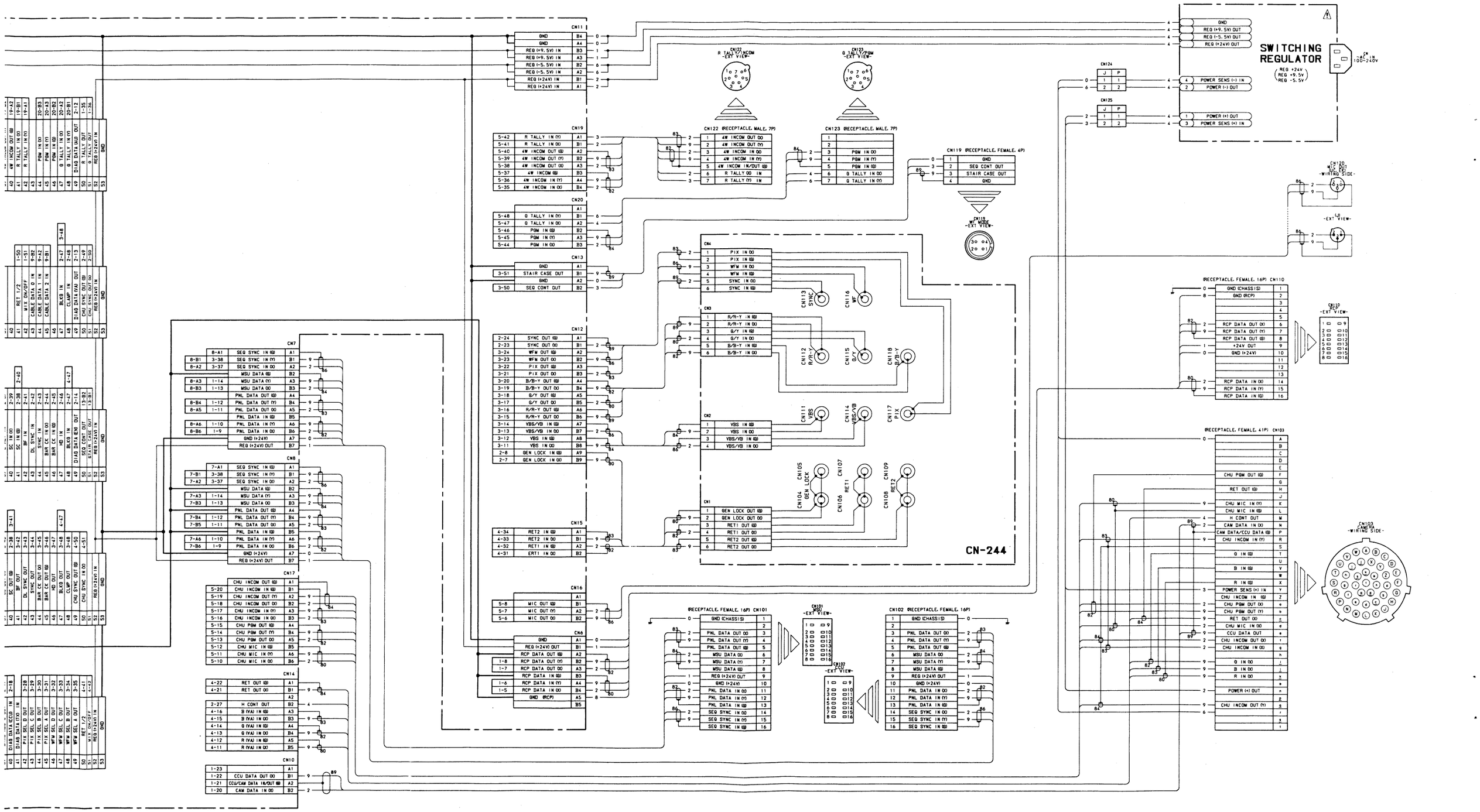
1-624-116-11

FRAME (2/2) CN-244 MB-175

FRAME (2/2)

CN-244 BOARD
MB-175 BOARD
SW-266 BOARD




CN11
GND B4
GND A4
REG (+9.5V) IN B3
REG (+9.5V) IN A3
REG (-5.5V) IN B2
REG (-5.5V) IN A2
REG (+24V) IN B1
REG (+24V) IN A1
CN19
5-42 R TALLY IN (Y) A1
5-41 R TALLY IN (X) B1
5-40 4W INCOM OUT (G) A2
5-39 4W INCOM OUT (Y) B2
5-38 4W INCOM OUT (X) A3
5-37 4W INCOM (G) B3
5-36 4W INCOM IN (Y) A4
5-35 4W INCOM IN (X) B4
CN20
5-48 G TALLY IN (Y) B1
5-47 G TALLY IN (X) A2
5-46 PGM IN (G) B2
5-45 PGM IN (Y) A3
5-44 PGM IN (X) B3
CN13
3-51 STAIR CASE OUT B1
GND A2
3-50 SEQ CONT OUT B2
CN12
2-24 SYNC OUT (G) A1
2-23 SYNC OUT (X) B1
3-24 WFM OUT (G) A2
3-23 WFM OUT (X) B2
3-22 PIX OUT (G) A3
3-21 PIX OUT (X) B3
3-20 B/B-Y OUT (G) A4
3-19 B/B-Y OUT (X) B4
3-18 G/Y OUT (G) A5
3-17 G/Y OUT (X) B5
3-16 R/R-Y OUT (G) A6
3-15 R/R-Y OUT (X) B6
3-14 VBS/YB IN (G) A7
3-13 VBS/YB IN (X) B7
3-12 VBS IN (G) A8
3-11 VBS IN (X) B8
2-8 GEN LOCK IN (G) A9
2-7 GEN LOCK IN (X) B9
CN15
4-34 RET2 IN (G) A1
4-33 RET2 IN (X) B1
4-32 RET1 IN (G) A2
4-31 ERT1 IN (X) B2
CN16
5-8 WIC OUT (G) B1
5-7 WIC OUT (Y) A2
5-6 WIC OUT (X) B2
CN6
GND A1
REG (+24V) OUT B1
1-8 RCP DATA OUT (Y) B2
RCP DATA OUT (X) A3
1-7 RCP DATA IN (G) B3
1-6 RCP DATA IN (Y) A4
1-5 RCP DATA IN (X) B4
GND (RCP) A5
B5
CN7
8-A1 SEQ SYNC IN (G) A1
8-B1 3-38 SEQ SYNC IN (Y) B1
8-A2 3-37 SEQ SYNC IN (X) A2
WSU DATA (G) B2
8-A3 1-14 WSU DATA (Y) A3
8-B3 1-13 WSU DATA (X) B3
PNL DATA OUT (G) A4
8-B4 1-12 PNL DATA OUT (Y) B4
8-A5 1-11 PNL DATA OUT (X) A5
PNL DATA IN (G) B5
8-A6 1-10 PNL DATA IN (Y) A6
8-B6 1-9 PNL DATA IN (X) B6
GND (+24V) A7
REG (+24V) OUT B7
CN8
7-A1 SEQ SYNC IN (G) A1
7-B1 3-38 SEQ SYNC IN (Y) B1
7-A2 3-37 SEQ SYNC IN (X) A2
WSU DATA (G) B2
7-A3 1-14 WSU DATA (Y) A3
7-B3 1-13 WSU DATA (X) B3
PNL DATA OUT (G) A4
7-B4 1-12 PNL DATA OUT (Y) B4
7-B5 1-11 PNL DATA OUT (X) A5
PNL DATA IN (G) B5
7-A6 1-10 PNL DATA IN (Y) A6
7-B6 1-9 PNL DATA IN (X) B6
GND (+24V) A7
REG (+24V) OUT B7
CN17
CHU INCOM OUT (G) A1
5-20 CHU INCOM IN (G) B1
5-19 CHU INCOM OUT (Y) A2
5-18 CHU INCOM OUT (X) B2
5-17 CHU INCOM IN (Y) A3
5-16 CHU INCOM IN (X) B3
5-15 CHU PGM OUT (G) A4
5-14 CHU PGM OUT (Y) B4
5-13 CHU PGM OUT (X) A5
5-12 CHU MIC IN (G) B5
5-11 CHU MIC IN (Y) A6
5-10 CHU MIC IN (X) B6
CN14
4-22 RET OUT (G) A1
4-21 RET OUT (X) B1
A2
2-27 H CONT OUT B2
4-16 B (YA) IN (G) A3
4-15 B (YA) IN (X) B3
4-14 G (YA) IN (G) A4
4-13 G (YA) IN (X) B4
4-12 R (YA) IN (G) A5
4-11 R (YA) IN (X) B5
CN10
1-23 A1
1-22 CCU DATA OUT (X) B1
1-21 CCU/CAM DATA IN/OUT (G) A2
1-20 CAM DATA IN (X) B2
CN22 R TALLY/INCOM -EXT VIEW-
CN23 G TALLY/PGM -EXT VIEW-
CN122 (RECEPTACLE, MALE, 7P)
1 4W INCOM OUT (X)
2 4W INCOM OUT (Y)
3 4W INCOM IN (X)
4 4W INCOM IN (Y)
5 4W INCOM IN/OUT (G)
6 R TALLY (X) IN
7 R TALLY (Y) IN
CN123 (RECEPTACLE, MALE, 7P)
1
2
3 PGM IN (X)
4 PGM IN (Y)
5 PGM IN (G)
6 G TALLY IN (X)
7 G TALLY IN (Y)
CN119 (RECEPTACLE, FEMALE, 4P)
1 GND
2 SEQ CONT OUT
3 STAIR CASE OUT
4 GND
CN119 WIC WIRE -EXT VIEW-
CN4
1 PIX IN (X)
2 PIX IN (G)
3 WFM IN (X)
4 WFM IN (G)
5 SYNC IN (X)
6 SYNC IN (G)
CN113 SYNC
CN116 WF
CN3
1 R/R-Y IN (G)
2 R/R-Y IN (X)
3 G/Y IN (G)
4 G/Y IN (X)
5 B/B-Y IN (G)
6 B/B-Y IN (X)
CN112 R/R-Y
CN115 G/Y
CN118 B/B-Y
CN2
1 VBS IN (G)
2 VBS IN (X)
3 VBS/YB IN (G)
4 VBS/YB IN (X)
CN111 VBS
CN114 VBS/YB
CN117 PIX
CN1
1 GEN LOCK OUT (G)
2 GEN LOCK OUT (X)
3 RET1 OUT (G)
4 RET1 OUT (X)
5 RET2 OUT (G)
6 RET2 OUT (X)
CN104 GEN LOCK
CN105
CN106 RET1
CN107
CN108 RET2
CN109
CN-244
(RECEPTACLE, FEMALE, 16P) CN101
GND (CHASSIS) 1
2
PNL DATA OUT (X) 3
PNL DATA OUT (Y) 4
PNL DATA OUT (G) 5
MSU DATA (X) 6
MSU DATA (Y) 7
MSU DATA (G) 8
REG (+24V) OUT 9
GND (+24V) 10
PNL DATA IN (X) 11
PNL DATA IN (Y) 12
PNL DATA IN (G) 13
SEQ SYNC IN (X) 14
SEQ SYNC IN (Y) 15
SEQ SYNC IN (G) 16
CN101 VBS -EXT VIEW-
CN107 PGM -EXT VIEW-
CN102 (RECEPTACLE, FEMALE, 16P)
1 GND (CHASSIS)
2
3 PNL DATA OUT (X)
4 PNL DATA OUT (Y)
5 PNL DATA OUT (G)
6 MSU DATA (X)
7 MSU DATA (Y)
8 MSU DATA (G)
9 REG (+24V) OUT
10 GND (+24V)
11 PNL DATA IN (X)
12 PNL DATA IN (Y)
13 PNL DATA IN (G)
14 SEQ SYNC IN (X)
15 SEQ SYNC IN (Y)
16 SEQ SYNC IN (G)
CN124
J P
1 1
2 2
CN125
J P
1 1
2 2
GND
REG (+9.5V) OUT
REG (-5.5V) OUT
REG (+24V) OUT
SWITCHING REGULATOR
REG +24V
REG +9.5V
REG -5.5V
~AC IN 100-240V
POWER SENS (-) IN
POWER (-) OUT
POWER (+) OUT
POWER SENS (+) IN
CN120 WIC OUT -WIRING SIDE-
4P -EXT VIEW-
(RECEPTACLE, FEMALE, 16P) CN110
GND (CHASSIS) 1
GND (RCP) 2
3
4
5
RCP DATA OUT (X) 6
RCP DATA OUT (Y) 7
RCP DATA OUT (G) 8
+24V OUT 9
GND (+24V) 10
11
12
13
RCP DATA IN (X) 14
RCP DATA IN (Y) 15
RCP DATA IN (G) 16
CN110 RCP -EXT VIEW-
(RECEPTACLE, FEMALE, 41P) CN103
CHU PGM OUT (G) F
G
RET OUT (G) H
J
CHU MIC IN (Y) K
CHU MIC IN (G) L
H CONT OUT M
CAM DATA IN (X) N
CAM DATA/CCU DATA (G) P
CHU INCOM IN (Y) R
S
G IN (G) T
U
B IN (G) V
W
R IN (G) X
POWER SENS (+) IN Y
CHU INCOM IN (G) Z
CHU PGM OUT (X) a
CHU PGM OUT (Y) b
RET OUT (X) c
CHU MIC IN (X) d
CCU DATA OUT e
CHU INCOM OUT (X) f
CHU INCOM IN (X) g
h
G IN (X) j
B IN (X) k
R IN (X) m
POWER (+) OUT n
p
CHU INCOM OUT (Y) q
r
s
t
CN103 CAMERA -WIRING SIDE-
SC OUT (G) 3-41
BF OUT 3-42
DL SYNC OUT 3-43
BAR CK OUT (G) 3-45
HD OUT 3-46
BLKG OUT 3-47
CLMP OUT 3-48
CHU SYNC OUT (G) 4-50
CHU SYNC IN (X) 4-51
REG (+24V) IN
GND
SC IN (G) 2-40
SC IN (X) 2-39
BF IN 2-38
DL SYNC IN 2-41
BAR CK IN (X) 2-42
BAR CK IN (G) 2-43
HD IN 2-44
BLKG IN 2-45
CLMP IN 2-46
DIAG DATA (YA) OUT 2-47
CHU SYNC OUT (G) 2-14
CHU SYNC IN (X) 13-B2
REG (+24V) IN 13-B1
GND
DIAG DATA (CCU) IN 2-18
PIX SEL C OUT 3-29
PIX SEL B OUT 3-30
PIX SEL A OUT 3-31
WFM SEL D OUT 3-32
WFM SEL C OUT 3-33
WFM SEL B OUT 3-34
WFM SEL A OUT 3-35
RET 1/2 4-41
WIC ON/OFF 4-52
REG (+24V) IN
GND
RET 1/2 1-50
WIC ON/OFF 1-51
CAM DATA IN 9-A2
CABLE DATA 1 IN 9-A2
CABLE DATA 2 IN 9-B1
BLKG IN 2-47
CLAMP IN 2-48
DIAG DATA (YA) OUT 2-13
CHU SYNC OUT (G) 2-49
CHU SYNC IN (X) 2-50
REG (+24V) IN
GND
4W INCOM OUT (G) 19-A2
R TALLY IN (X) 19-B1
R TALLY IN (Y) 19-A1
PGM IN (X) 20-B3
PGM IN (Y) 20-A3
PGM IN (G) 20-B2
G TALLY IN (X) 20-A2
G TALLY IN (Y) 20-B1
DIAG DATA (AU) OUT 2-12
R TALLY OUT 1-35
CAM DATA OUT 1-36
REG (+24V) IN
GND

SECTION D
SPARE PARTS

D-1. PARTS INFORMATION

1. **Safety Related Component Warning**

   Components identified by shading marked with ⚠ on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose parts numbers appear as shown in this manual or in service manual supplements published by Sony.

2. Replacement Parts supplied from Sony Parts Center will sometimes have different shape and outside view from the parts which actually in use. This is due to "**accommodating the improved parts and/or engineering changes**" or "**standardization of genuine parts.**" This manual's exploded view and electrical spare parts lists are indicating the parts numbers of "the standardized genuine parts at present." Regarding engineering parts and diagrams changes in our engineering department, refer SECTION 9. CHANGE INFORMATION.

3. **The parts marked with "S" in the SP column** of the exploded views and electical spare parts list are nomally required for routine service work. Orders for parts marked with "O" will be processed, but allow for additional delivery time.

4. Item with no parts number and/or no description are not stocked because they are seldom required for routine service.

5. **Abbreviation**

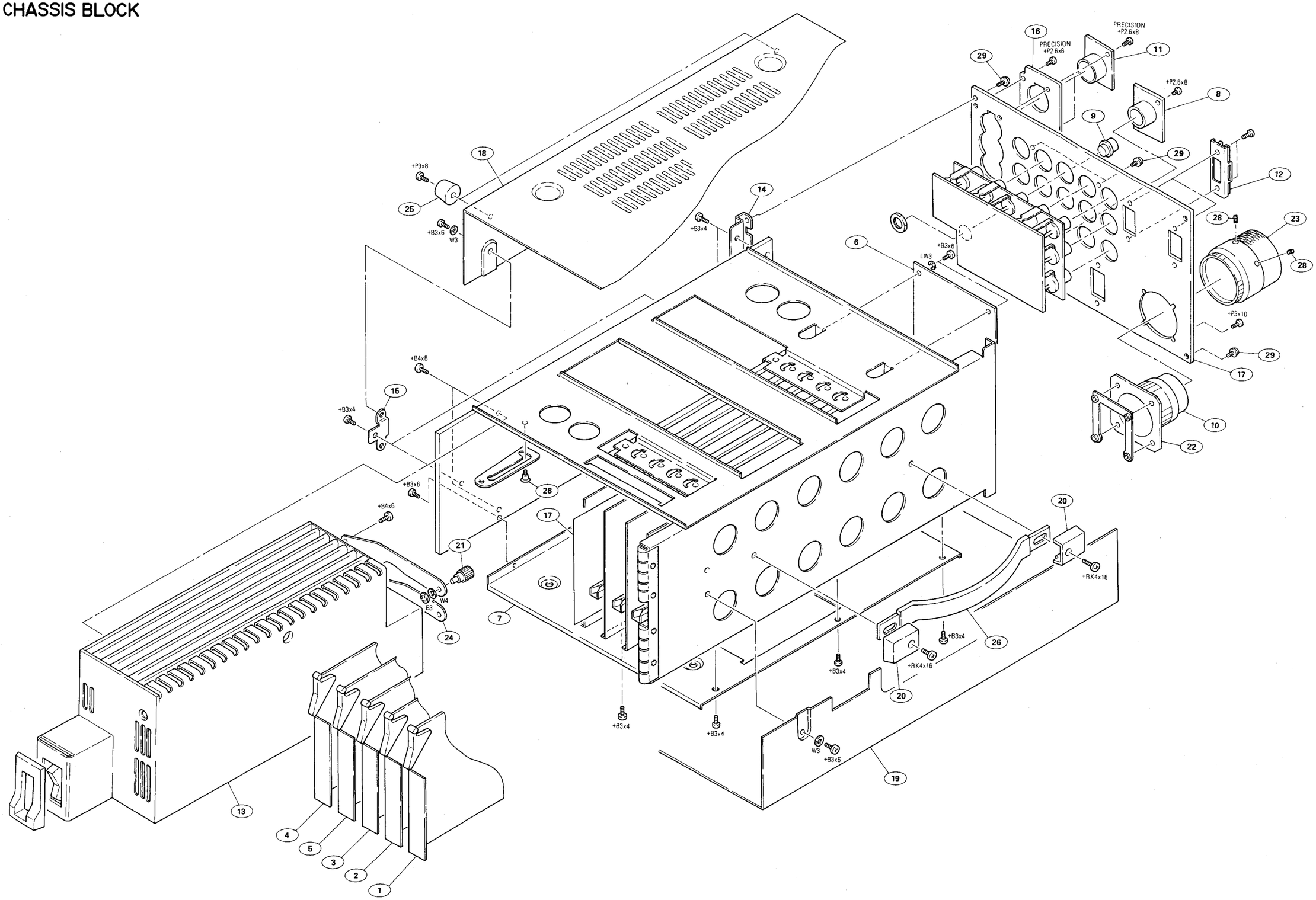
REF.No.	DESCRIPTION	REF.No.	DESCRIPTION	REF.No.	DESCRIPTION
BZ	BUZZER	**FL**	FILTER	**R**	RESISTOR
C	CAPACITOR	**IC**	IC	**RB**	RESISTOR BLOCK
CN	CONNECTOR	**J**	JACK	**RV**	VARIABLE RESISTOR
CP	COMBINATION PARTS	**JR**	SHORT RESISTOR	**S**	SWITCH
D	DIODE	**L**	INDUCTOR	**T**	TRANSFORMER
DL	DELAY LINE	**LV**	VARIABLE INDUCTOR	**THP**	THERMISTOR
FB	FERRITE BEAD RING	**Q**	TRANSISTOR	**X**	OSCILLATOR

All capacitors are in micro farads unless otherwise specified.
All inductors are in micro henries unless otherwise specified.
All resistors are in ohms.

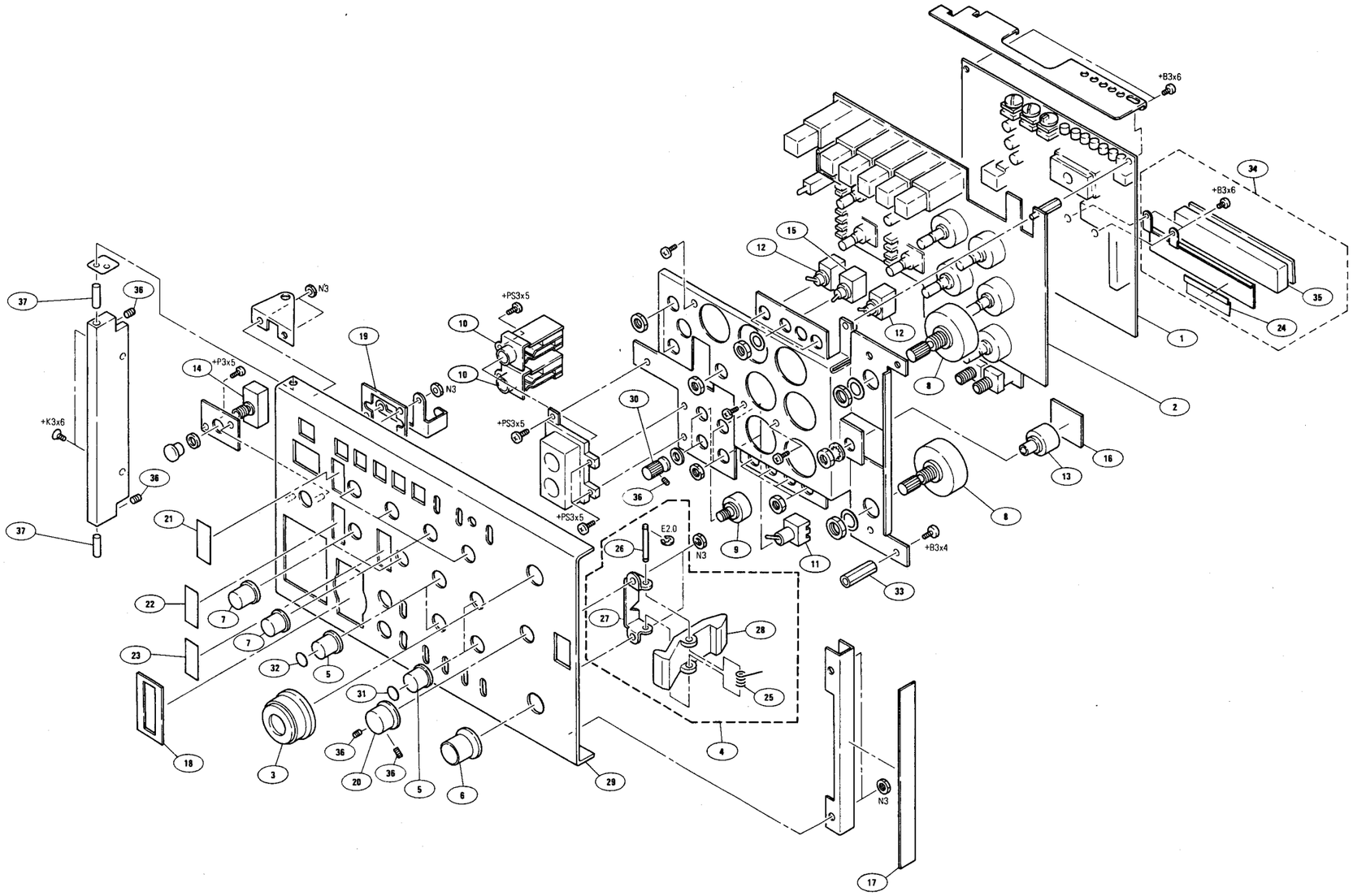
D-2. EXPLODED VIEW
CHASSIS BLOCK

No.	Part No.	SP	Description
1	A-7513-600-A	o	MOUNTED CIRCUIT BOARD "AU-98"
2	A-7513-601-A	o	MOUNTED CIRCUIT BOARD "VA-63"
3	A-7513-602-A	o	MOUNTED CIRCUIT BOARD "EN-64" (FOR UC)
	A-7515-002-A	o	MOUNTED CIRCUIT BOARD "EN-64J" (FOR J)
4	A-7515-337-A	o	MOUNTED CIRCUIT BOARD "AT-65"
5	A-7513-605-A	o	MOUNTED CIRCUIT BOARD "SG-131" (FOR UC, J)
	A-7513-606-A	o	MOUNTED CIRCUIT BOARD "SG-131P" (FOR EK)
6	A-7513-607-A	o	MOUNTED CIRCUIT BOARD "MB-175"
7	X-2355-310-1	o	PLATE ASSY, BOTTOM
8	1-509-176-51	s	RECEPTACLE 3P MALE "MIC OUT" (FOR UC, EK)
	1-509-184-51	s	RECEPTACLE 3P FEMALE "MIC OUT" (FOR J)
9	1-561-376-00	s	RECEPTACLE 4P FEMALE "WF MODE"
10	1-561-482-00	o	RECEPTACLE "CAMERA"
11	1-561-846-31	s	RECEPTACLE 7P MALE "INCOM" "PGM"
12	1-564-968-11	s	RECEPTACLE MALTI (SQUARE) 16P "MSU" "CCU" "RCP"
13	⚠ 1-413-352-12	s	REGULATOR, SWITCHING
14	2-126-619-01	o	STOPPER, REAR PANEL
15	2-126-620-01	o	STOPPER, COVER
16	2-126-624-01	o	PANEL, XLR, REAR
17	2-126-628-01	o	PANEL, REAR
18	2-126-634-01	o	COVER
19	2-126-634-11	o	COVER
20	2-253-306-00	o	TABLE, HANDLE
21	2-270-617-00	s	SCREW, KNOB
22	2-270-648-00	o	NUT (41P), PLATE
23	2-270-694-00	s	RING
24	2-355-381-01	o	CLAMP, CABLE
25	3-143-272-00	s	FOOT, RUBBER
26	3-419-372-21	s	HANDLE
27	3-613-164-00	o	SHAFT, STEP
28	3-701-505-00	s	SET SCREW, DOUBLE POINT 3×3
29	3-719-159-01	s	SCREW, BW (M3) S/N 10301 AND HIGHER (J) S/N 20301 AND HIGHER (UC) S/N 30201 AND HIGHER (EK)

CHASSIS BLOCK



FRONT PANEL BLOCK

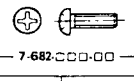


FRONT PANEL BLOCK

No.	Part No.	SP	Description
1	A-7513-608-A	o	MOUNTED CIRCUIT BOARD "IF-177"
2	A-7513-609-A	o	MOUNTED CIRCUIT BOARD "CP-120"
3	X-2270-601-0	s	KNOB ASSY
4	X-2355-309-1	o	LOCK ASSY, FRONT
5	X-2355-502-1	s	KNOB ASSY, CONTROL
6	X-3651-342-0	s	KNOB ASSY, CONTROL
7	X-3670-503-0	s	KNOB ASSY, CONTROL
8	1-226-786-00	s	RES, VAR, CERMET 10K "IRTS" "MASTER BLACK"
9	1-230-817-11	s	RES, VAR, CARBON 5k "INCOM" "PGM"
10	1-507-676-11	s	JACK, PHONE "INCOM" "PGM" S/N UP TO 20630 (UC) 30560 (EK) 10510 (J)
	1-507-184-11	s	JACK, PHONE "INCOM" "PGM" S/N 20701 AND HIGHER (UC) 30601 AND HIGHER (EK) 10601 AND HIGHER (J)
11	1-553-626-11	s	SWITCH, TOGGLE "MIC ON/OFF" "COMM/PRIV"
12	1-553-969-00	s	SWITCH, TOGGLE "KNEE AUTO/MAN" "IRIS AUTO/MAN"
13	1-570-132-11	s	SWITCH, ROTARY "CABLE COMP"
14	1-570-172-11	s	SWITCH, PUSH (1 KEY) "CALL"
15	1-571-290-11	s	SWITCH, TOGGLE "AUTO SETUP START/BREAK"
16	1-624-569-11	o	PRINTED CIRCUIT BOARD "SW-266"
17	2-126-603-01	o	PLATE, ORNAMENTAL, SIDE
18	2-126-604-01	o	SHEET, WJ
19	2-126-605-01	o	COVER
20	2-126-606-01	s	KNOB
21	2-126-608-01	o	SHEET, LETTER
22	2-126-608-11	o	SHEET, LETTER
23	2-126-608-21	o	SHEET, LETTER
24	2-126-652-01	o	SHEET, INSULATING, PCB RETAINER
25	2-126-615-01	o	SPRING, TORTION
26	2-126-616-01	o	SHAFT, LOCK
27	2-126-617-01	o	BRACKET, LOCK
28	2-126-618-01	o	LATCH
29	2-126-635-02	o	PANEL, FRONT
30	2-270-649-00	s	KNOB, A
31	2-270-659-00	s	MARKER (B)
32	2-270-660-00	s	MARKER (R)
33	2-280-622-31	o	SUPPORT (M3x12), HEXAGON
34	X-2355-314-2	o	RETAINER, PC BOARD
35	2-355-399-01	o	CUSHION, PC BOARD RETAINER
36	3-701-505-00	s	SET SCREW, DOUBLE POINT 3x3
37	3-703-360-03	o	PIN, PARALLEL (DIA, 3x10)

SCREWS

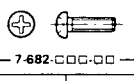
+B
Bzn-N



7-682-□□□-□□

SIZE	Parts No.
3 x 3	544-09
x 4	545-09
x 5	546-09
x 6	547-09
x 8	548-09
x 10	549-09
x 12	550-09
x 14	551-09
x 16	552-09
x 20	553-09
x 30	555-09
4 x 4	558-09
x 5	559-09
x 6	560-09
x 8	561-09
x 10	562-09
x 12	563-09
x 14	564-09
x 16	565-09
x 20	566-09
5 x 8	574-09
x 10	575-09
x 12	576-09
x 14	577-09
x 16	578-09
x 20	579-09

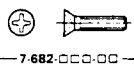
+B
Cr-N



7-682-□□□-□□

SIZE	Parts No.
3 x 3	544-04
x 4	545-04
x 5	546-04
x 6	547-04
x 8	548-04
x 10	549-04
x 12	550-04
x 14	551-04
x 16	552-04
x 20	553-04
4 x 4	558-04
x 5	559-04
x 6	560-04
x 8	561-04
x 10	562-04
x 12	563-04
x 14	564-04
x 16	565-04
x 20	566-04
5 x 8	574-04
x 10	575-04
x 12	576-04
x 14	577-04
x 16	578-04
x 20	579-04

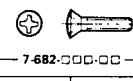
+K
Cr-N



7-682-□□□-□□

SIZE	Parts No.
3 x 4	245-04
x 5	246-04
x 6	247-04
x 8	248-04
x 10	249-04
x 12	250-04
x 14	251-04
x 16	252-04
x 20	253-04
4 x 6	260-04
x 8	261-04
x 10	262-04
x 12	263-04
x 14	264-04
x 16	265-04
x 20	266-04

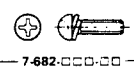
+RK
Cr-N



7-682-□□□-□□

SIZE	Parts No.
3 x 4	245-04
x 5	246-04
x 6	347-04
x 8	348-04
x 10	349-04
x 12	350-04
x 14	351-04
x 16	352-04
x 20	353-04
4 x 6	360-04
x 8	361-04
x 10	362-04
x 12	363-04
x 14	364-04
x 16	365-04
x 20	366-04

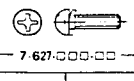
+PS
Bzn-N



7-682-□□□-□□

SIZE	Parts No.
2 x 4	253-00
x 5	253-10
x 6	253-20
x 8	253-30
x 10	253-40
x 12	253-50
2.6 x 4	253-90
x 5	254-00
x 6	254-10
x 8	254-20
x 10	254-30
x 12	254-40
x 14	254-90
x 16	254-50
x 20	254-60
3 x 5	646-09
x 6	647-09
x 8	648-09
x 10	649-09
x 12	650-09
x 14	651-09
x 16	652-09
x 20	–
4 x 6	–
x 8	–
x 10	–
x 12	–
x 14	–
x 16	–
x 20	–

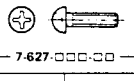
PRECISION +P
Bzn-N



7-627-□□□-□□

SIZE	Parts No.
1.7 x 1.6	552-18
x 1.8	–
x 2	552-28
x 2.2	–
x 2.5	552-08
x 2.8	–
x 3	552-38
x 3.5	552-78
x 4	552-48
x 4.5	–
x 5	552-58
x 5.5	–
x 6	–
2 x 1.8	554-38
x 2	553-18
x 2.2	–
x 2.5	553-28
x 2.8	554-58
x 3	553-38
x 3.5	554-18
x 4	553-48
x 4.5	553-58
x 5	–
x 5.5	–
x 6	553-68
x 7	553-88
x 8	553-98
x 10	553-78
2.6 x 2.8	556-08
x 3	–
x 3.5	556-28
x 4	556-38
x 4.5	556-48
x 5	556-58
x 5.5	–
x 6	556-78
x 7	–
x 8	–
x 9	–
x 10	–

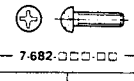
PRECISION +P
Cr-N



7-627-□□□-□□

SIZE	Parts No.
1.7 x 1.6	–
x 1.8	–
x 2	552-27
x 2.2	552-87
x 2.5	552-07
x 2.8	–
x 3	552-37
x 3.5	–
x 4	552-47
x 4.5	552-67
x 5	552-57
x 5.5	557-07
x 6	552-77
2 x 1.8	554-37
x 2	553-17
x 2.2	554-07
x 2.5	553-27
x 2.8	–
x 3	553-37
x 3.5	554-17
x 4	553-47
x 4.5	553-57
x 5	553-67
x 5.5	–
x 6	554-27
x 7	553-87
x 8	553-97
x 10	553-77
2.6 x 2.8	556-07
x 3	–
x 3.5	–
x 4	556-37
x 4.5	–
x 5	–
x 5.5	–
x 6	556-77
x 7	–
x 8	556-97
x 9	–
x 10	557-47

+P
Bzn-N



7-682-□□□-□□

SIZE	Parts No.
3 x 3	144-09
x 4	145-09
x 5	146-09
x 6	147-09
x 8	148-09
x 10	149-09
x 12	150-09
x 14	151-09
4 x 4	158-09
x 5	159-09
x 6	160-09
x 8	161-09
x 10	162-09
x 12	163-09
x 14	164-09
x 16	165-09
x 20	166-09

D-3. ELECTRICAL PARTS LIST

Parts that are not listed in the "reference numbers order list" are shown in following table. (Page D-9 to D-11)
Reference numbers are omitted.

The parts marked with "s" in th SP column of the exploded views and electrical spare parts list are normally required for routine service work. Orders for parts marked with "o" will be processed, but allow for additional delivery time.

SB42751 (V-1)

CAPACITOR, TANTALUM

0.01 -100 (E6) 3.15V -35V

Part No.	SP	Description		
1-131-396-11	s	CAP, TANTALUM 0.01	20%	35V
1-131-397-11	s	CAP, TANTALUM 0.015	20%	35V
1-131-398-11	s	CAP, TANTALUM 0.022	20%	35V
1-131-399-11	s	CAP, TANTALUM 0.033	20%	35V
1-131-400-11	s	CAP, TANTALUM 0.047	20%	35V
1-131-401-21	s	CAP, TANTALUM 0.068	10%	35V
1-131-341-21	s	CAP, TANTALUM 0.1	10%	35V
1-131-342-21	s	CAP, TANTALUM 0.15	10%	35V
1-131-343-21	s	CAP, TANTALUM 0.22	10%	35V
1-131-344-21	s	CAP, TANTALUM 0.33	10%	35V
1-131-412-11	s	CAP, TANTALUM 0.47	20%	20V
1-131-345-21	s	CAP, TANTALUM 0.47	10%	35V
1-131-410-11	s	CAP, TANTALUM 0.68	20%	25V
1-131-346-21	s	CAP, TANTALUM 0.68	10%	35V
1-131-413-11	s	CAP, TANTALUM 1.0	20%	20V
1-131-347-21	s	CAP, TANTALUM 1.0	10%	35V
1-131-416-11	s	CAP, TANTALUM 1.5	20%	16V
1-131-348-21	s	CAP, TANTALUM 1.5	10%	35V
1-131-419-11	s	CAP, TANTALUM 2.2	20%	10V
1-131-361-21	s	CAP, TANTALUM 2.2	10%	20V
1-131-349-21	s	CAP, TANTALUM 2.2	10%	35V
1-131-422-11	s	CAP, TANTALUM 3.3	20%	6.3V
1-131-368-21	s	CAP, TANTALUM 3.3	10%	16V
1-131-356-21	s	CAP, TANTALUM 3.3	10%	25V
1-131-350-21	s	CAP, TANTALUM 3.3	10%	35V
1-131-425-11	s	CAP, TANTALUM 4.7	20%	3.15V
1-131-375-21	s	CAP, TANTALUM 4.7	10%	10V
1-131-363-21	s	CAP, TANTALUM 4.7	10%	20V
1-131-351-21	s	CAP, TANTALUM 4.7	10%	35V
1-131-382-11	s	CAP, TANTALUM 6.8	10%	6.3V
1-131-370-11	s	CAP, TANTALUM 6.8	10%	16V
1-131-358-21	s	CAP, TANTALUM 6.8	10%	25V
1-131-352-21	s	CAP, TANTALUM 6.8	10%	35V
1-131-389-21	s	CAP, TANTALUM 10	10%	3.15V
1-131-377-21	s	CAP, TANTALUM 10	10%	10V
1-131-365-21	s	CAP, TANTALUM 10	10%	20V
1-131-353-21	s	CAP, TANTALUM 10	10%	35V
1-131-384-21	s	CAP, TANTALUM 15	10%	6.3V
1-131-372-21	s	CAP, TANTALUM 15	10%	16V
1-131-360-21	s	CAP, TANTALUM 15	10%	25V
1-131-391-21	s	CAP, TANTALUM 22	10%	3.15V
1-131-379-21	s	CAP, TANTALUM 22	10%	10V
1-131-367-21	s	CAP, TANTALUM 22	10%	20V
1-131-386-21	s	CAP, TANTALUM 33	10%	6.3V
1-131-374-21	s	CAP, TANTALUM 33	10%	16V
1-131-393-21	s	CAP, TANTALUM 47	10%	3.15V
1-131-381-21	s	CAP, TANTALUM 47	10%	10V
1-131-388-21	s	CAP, TANTALUM 68	10%	6.3V
1-131-395-21	s	CAP, TANTALUM 100	10%	3.15V

SB73444 (V-1)

CAPACITOR, CHIP CERAMIC

1pF - 4pF CH ±0.25pF 50V
6pF - 8pF CH ±0.5pF 50V
10pF - 1000pF CH ±5% 50V
1500pF - 6800pF B ±10% 50V
0.01uF - 0.015uF B ±10% 50V
0.033uF - 0.047uF F +80/-20% 50V
0.068uF - 0.1uF B +80/-20% 25V

Part No.	SP	Desctiption
1-163-083-00	s	CAP, CHIP CERAMIC 1pF ±0.25pF 50V
1-163-085-00	s	CAP, CHIP CERAMIC 2pF ±0.25pF 50V
1-163-087-00	s	CAP, CHIP CERAMIC 4pF ±0.25pF 50V
1-163-089-00	s	CAP, CHIP CERAMIC 6pF ±0.5pF 50V
1-163-091-00	s	CAP, CHIP CERAMIC 8pF ±0.5pF 50V
1-163-093-00	s	CAP, CHIP CERAMIC 10pF 5% 50V
1-163-097-00	s	CAP, CHIP CERAMIC 15pF 5% 50V
1-163-101-00	s	CAP, CHIP CERAMIC 22pF 5% 50V
1-163-105-00	s	CAP, CHIP CERAMIC 33pF 5% 50V
1-163-109-00	s	CAP, CHIP CERAMIC 47pF 5% 50V
1-163-113-00	s	CAP, CHIP CERAMIC 68pF 5% 50V
1-163-117-00	s	CAP, CHIP CERAMIC 100PF 5% 50V
1-163-121-00	s	CAP, CHIP CERAMIC 150pF 5% 50V
1-163-125-00	s	CAP, CHIP CERAMIC 220pF 5% 50V
1-163-129-00	s	CAP, CHIP CERAMIC 330pF 5% 50V
1-163-133-00	s	CAP, CHIP CERAMIC 470pF 5% 50V
1-163-137-00	s	CAP, CHIP CERAMIC 680pF 5% 50V
1-163-141-00	s	CAP, CHIP CERAMIC 1000pF 5% 50V
1-163-145-00	s	CAP, CHIP CERAMIC 1500pF 10% 50V
1-163-013-00	s	CAP, CHIP CERAMIC 2200pF 10% 50V
1-163-015-00	s	CAP, CHIP CERAMIC 3300pF 10% 50V
1-163-017-00	s	CAP, CHIP CERAMIC 4700pF 10% 50V
1-163-019-00	s	CAP, CHIP CERAMIC 6800pF 10% 50V
1-163-021-00	s	CAP, CHIP CERAMIC 0.01 10% 50V
1-163-023-00	s	CAP, CHIP CERAMIC 0.015 10% 50V
1-163-034-00	s	CAP, CHIP CERAMIC 0.033 50V
1-163-035-00	s	CAP, CHIP CERAMIC 0.047 50V
1-163-036-00	s	CAP, CHIP CERAMIC 0.068 50V
1-163-038-00	s	CAP, CHIP CERAMIC 0.1 50V

SB-73424 (V-1) (1/2)

RESISTOR, CHIP

1/10W
0 ~ 3.3M (E12) ±5% 1/10W

Part No.	SP	Description
1-216-295-00	s	RES, CHIP 0 5% 1/10W
1-216-298-00	s	RES, CHIP 2.2 5% 1/10W
1-216-302-00	s	RES, CHIP 2.7 5% 1/10W
1-216-304-00	s	RES, CHIP 3.3 5% 1/10W
1-216-306-00	s	RES, CHIP 3.9 5% 1/10W
1-216-308-00	s	RES, CHIP 4.7 5% 1/10W
1-216-309-00	s	RES, CHIP 5.6 5% 1/10W
1-216-311-00	s	RES, CHIP 6.8 5% 1/10W
1-216-313-00	s	RES, CHIP 8.2 5% 1/10W
1-216-001-00	s	RES, CHIP 10 5% 1/10W
1-216-003-00	s	RES, CHIP 12 5% 1/10W
1-216-005-00	s	RES, CHIP 15 5% 1/10W
1-216-007-00	s	RES, CHIP 18 5% 1/10W
1-216-009-00	s	RES, CHIP 22 5% 1/10W
1-216-011-00	s	RES, CHIP 27 5% 1/10W
1-216-013-00	s	RES, CHIP 33 5% 1/10W
1-216-015-00	s	RES, CHIP 39 5% 1/10W
1-216-017-00	s	RES, CHIP 47 5% 1/10W
1-216-019-00	s	RES, CHIP 56 5% 1/10W
1-216-021-00	s	RES, CHIP 68 5% 1/10W
1-216-023-00	s	RES, CHIP 82 5% 1/10W
1-216-025-00	s	RES, CHIP 100 5% 1/10W
1-216-027-00	s	RES, CHIP 120 5% 1/10W
1-216-029-00	s	RES, CHIP 150 5% 1/10W
1-216-031-00	s	RES, CHIP 180 5% 1/10W
1-216-033-00	s	RES, CHIP 220 5% 1/10W
1-216-035-00	s	RES, CHIP 270 5% 1/10W
1-216-037-00	s	RES, CHIP 330 5% 1/10W
1-216-039-00	s	RES, CHIP 390 5% 1/10W
1-216-041-00	s	RES, CHIP 470 5% 1/10W
1-216-043-00	s	RES, CHIP 560 5% 1/10W
1-216-045-00	s	RES, CHIP 680 5% 1/10W
1-216-047-00	s	RES, CHIP 820 5% 1/10W
1-216-049-00	s	RES, CHIP 1K 5% 1/10W
1-216-051-00	s	RES, CHIP 1.2K 5% 1/10W
1-216-053-00	s	RES, CHIP 1.5K 5% 1/10W
1-216-055-00	s	RES, CHIP 1.8K 5% 1/10W
1-216-057-00	s	RES, CHIP 2.2K 5% 1/10W
1-216-059-00	s	RES, CHIP 2.7K 5% 1/10W
1-216-061-00	s	RES, CHIP 3.3K 5% 1/10W
1-216-063-00	s	RES, CHIP 3.9K 5% 1/10W
1-216-065-00	s	RES, CHIP 4.7K 5% 1/10W
1-216-067-00	s	RES, CHIP 5.6K 5% 1/10W
1-216-069-00	s	RES, CHIP 6.8K 5% 1/10W
1-216-071-00	s	RES, CHIP 8.2K 5% 1/10W
1-216-073-00	s	RES, CHIP 10K 5% 1/10W
1-216-075-00	s	RES, CHIP 12K 5% 1/10W
1-216-077-00	s	RES, CHIP 15K 5% 1/10W
1-216-079-00	s	RES, CHIP 18K 5% 1/10W
1-216-081-00	s	RES, CHIP 22K 5% 1/10W

Part No.	SP	Description
1-216-083-00	s	RES, CHIP 27K 5% 1/10W
1-216-085-00	s	RES, CHIP 33K 5% 1/10W
1-216-087-00	s	RES, CHIP 39K 5% 1/10W
1-216-089-00	s	RES, CHIP 47K 5% 1/10W
1-216-091-00	s	RES, CHIP 56K 5% 1/10W
1-216-093-00	s	RES, CHIP 68K 5% 1/10W
1-216-095-00	s	RES, CHIP 82 5% 1/10W
1-216-097-00	s	RES, CHIP 100K 5% 1/10W
1-216-099-00	s	RES, CHIP 120K 5% 1/10W
1-216-101-00	s	RES, CHIP 150K 5% 1/10W
1-216-103-00	s	RES, CHIP 180K 5% 1/10W
1-216-105-00	s	RES, CHIP 220K 5% 1/10W
1-216-107-00	s	RES, CHIP 270K 5% 1/10W
1-216-109-00	s	RES, CHIP 330K 5% 1/10W
1-216-111-00	s	RES, CHIP 390K 5% 1/10W
1-216-113-00	s	RES, CHIP 470K 5% 1/10W
1-216-115-00	s	RES, CHIP 560K 5% 1/10W
1-216-117-00	s	RES, CHIP 680K 5% 1/10W
1-216-119-00	s	RES, CHIP 820K 5% 1/10W
1-216-121-00	s	RES, CHIP 1.0M 5% 1/10W
1-216-123-00	s	RES, CHIP 1.2M 5% 1/10W
1-216-125-00	s	RES, CHIP 1.5M 5% 1/10W
1-216-127-00	s	RES, CHIP 1.8M 5% 1/10W
1-216-129-00	s	RES, CHIP 2.2M 5% 1/10W
1-216-131-00	s	RES, CHIP 2.7M 5% 1/10W
1-216-133-00	s	RES, CHIP 3.3M 5% 1/10W

Ref. No.	Part No.	SP	Description

			AT-65 BOARD

	A-7515-337-A	o	MOUNTED CIRCUIT BOARD
1pc	2-251-622-00	s	LEVER, PC BOARD
1pc	7-626-317-11	s	PIN, SPRING 2.5X6
2pcs	7-682-545-09	s	SCREW +B 3X4
BZ1	1-502-913-00	s	ALARM
C1	1-161-485-00	s	CERAMIC 0.1uF 50V
C2	1-161-485-00	s	CERAMIC 0.1uF 50V
C3	1-162-767-11	s	CERAMIC 0.0015uF 5% 50V
C4	1-163-227-11	s	CERAMIC 10PF 5% 50V
C5	1-162-765-11	s	CERAMIC 0.001uF 5% 50V
C7	1-164-232-11	s	CERAMIC, CHIP 0.01uF 25V
C11	1-126-157-11	s	ELECT 10uF 20% 16V
C14	1-124-234-00	s	ELECT 22uF 20% 16V
C15	1-163-033-00	s	CERAMIC, CHIP 0.022uF 50V
C17	1-163-135-00	s	CERAMIC, CHIP 560PF 5% 50V
C18	1-163-263-11	s	CERAMIC 330PF 5% 50V
C19	1-163-263-11	s	CERAMIC 330PF 5% 50V
C22	1-126-157-11	s	ELECT 10uF 20% 16V
C23	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 50V
C26	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 50V
C27	1-164-048-11	s	CERAMIC 12PF 5% 50V
C28	1-164-048-11	s	CERAMIC 12PF 5% 50V
C29	1-124-242-00	s	ELECT 33uF 20% 25V
C31	1-126-157-11	s	ELECT 10uF 20% 16V
C32	1-124-234-00	s	ELECT 22uF 20% 16V
C33	1-124-234-00	s	ELECT 22uF 20% 16V
C34	1-124-234-00	s	ELECT 22uF 20% 16V
C35	1-126-157-11	s	ELECT 10uF 20% 16V
C37	1-163-263-11	s	CERAMIC 330PF 5% 50V
C41	1-124-234-00	s	ELECT 22uF 20% 16V
C43	1-126-163-11	s	ELECT 4.7MF 20% 50V
C44	1-126-101-11	s	ELECT 100uF 20% 16V
C45	1-124-443-00	s	ELECT 100uF 20% 10V
C46	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 50V
C48	1-126-153-11	s	ELECT 22uF 20% 6.3V
C51	1-131-347-00	s	TANTALUM 1uF 10% 35V
C52	1-124-229-00	s	ELECT 33uF 20% 10V
C53	1-126-101-11	s	ELECT 100uF 20% 16V
C54	1-126-176-11	s	ELECT 220uF 20% 10V
C55	1-124-443-00	s	ELECT 100uF 20% 10V
C56	1-124-229-00	s	ELECT 33uF 20% 10V
C68	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 50V
CN1	1-560-747-00	o	CONNECTOR, 53P, MALE
CN17	1-526-662-21	s	SOCKET, IC (DP) 40P
CN119	1-526-662-21	s	SOCKET, IC (DP) 40P
CN128	1-526-662-21	s	SOCKET, IC (DP) 40P
D1	8-719-800-76	s	DIODE 1SS226
D2	8-719-800-76	s	DIODE 1SS226
D3	8-719-400-18	s	DIODE MA152WK
D4	8-719-800-76	s	DIODE 1SS226
D5	8-719-800-76	s	DIODE 1SS226
D6	8-719-800-76	s	DIODE 1SS226
D7	8-719-907-19	s	DIODE, VARICAP FC52M-5
D8	8-719-104-34	s	DIODE 1S2836
D9	8-719-800-76	s	DIODE 1SS226
D10	8-719-104-34	s	DIODE 1S2836
D11	8-719-101-47	s	DIODE RD4.7EL2
D12	8-719-101-47	s	DIODE RD4.7EL2
D13	8-719-981-00	s	DIODE ERC81-004
FB1	1-535-178-00	s	BEAD, FERRITE
FB2	1-535-178-00	s	BOEAD, FERRITE
FB3	1-535-178-00	s	BEAD, FERRITE
IC1	8-759-906-53	s	IC TL062CPS
IC2	8-759-208-13	s	IC TC4016BFHB
IC3	8-759-200-77	s	IC TC4028BF
IC4	8-759-906-53	s	IC TL062CPS
IC5	8-759-201-53	s	IC TC40H000F
IC6	8-759-996-82	s	IC MSM82C55A-2GS
IC7	8-759-996-81	s	IC MSM80C154RS
IC8	8-759-204-89	s	IC TC40H373F
IC9	8-759-201-53	s	IC TC40H000F
IC10	8-759-197-00	s	IC UPD28C64ACZ-20
IC11	8-759-201-53	s	IC TC40H000F
IC12	8-759-186-68	s	IC 27C512-C35A65-V3.01
IC13	8-759-204-82	s	IC TC40H244F
IC14	8-759-204-83	s	IC TC40H245F
IC15	8-759-031-84	s	IC TC7S04F
IC16	8-752-326-23	s	IC CXK58257M-10L
IC17	8-759-204-89	s	IC TC40H373F
IC18	8-759-204-71	s	IC TC40H163F
IC19	8-759-098-08	s	IC MSM80C49-884RS
IC20	8-759-204-66	s	IC TC40H157F
IC21	8-759-926-72	s	IC SN74HC386NS
IC22	8-759-008-74	s	IC MC14001BF
IC23	8-759-009-04	s	IC MC14050BF
IC24	8-759-906-53	s	IC TL062CPS
IC25	8-759-996-82	s	IC MSM82C55A-2GS
IC26	8-759-204-60	s	IC TC40H139F
IC27	8-759-973-71	s	IC TL7705CPS-B
IC28	8-759-999-62	s	IC MSM80C49-831RS
IC29	8-759-204-82	s	IC TC40H244F
IC30	8-759-008-83	s	IC MC14014BF

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Ref. No.	Part No.	SP	Description
IC31	8-759-102-82	s	IC UPD82C43G
IC32	8-759-204-72	s	IC TC40H164F
IC33	8-759-204-72	s	IC TC40H164F
IC34	8-759-201-61	s	IC TC40H004F
IC35	8-759-300-71	s	IC MC14053BF
IC36	8-759-008-83	s	IC MC14014BF
IC37	8-759-201-61	s	IC TC40H004F
IC38	8-759-906-53	s	IC TL062CPS
IC39	8-759-201-53	s	IC TC40H000F
IC40	8-759-201-53	s	IC TC40H000F
IC41	8-759-204-71	s	IC TC40H163F
IC42	8-759-204-71	s	IC TC40H163F
IC43	8-759-204-20	s	IC TC4024BF
IC44	8-759-201-53	s	IC TC40H000F
IC45	8-759-925-96	s	IC SN74HC85NS
IC46	8-759-939-25	s	IC SN75176BP
IC47	8-759-908-95	s	IC TL1451CNS
IC48	8-759-906-53	s	IC TL062CPS
IC49	8-759-300-71	s	IC MC14053BF
L1	1-408-413-00	s	INDUCTOR 22uH
L2	1-408-413-00	s	INDUCTOR 22uH
L3	1-408-413-00	s	INDUCTOR 22uH
L4	1-408-413-00	s	INDUCTOR 22uH
L5	1-408-421-00	s	INDUCTOR 100uH
L6	1-408-421-00	s	INDUCTOR 100uH
L7	1-410-948-11	s	INDUCTOR 100uH
L8	1-408-413-00	s	INDUCTOR 22uH
PH1	8-719-800-74	s	DIODE TLP651-VIDEO
PH2	8-719-800-74	s	DIODE TLP651-VIDEO
Q1	8-729-100-66	s	TRANSISTOR 2SC1623
Q2	8-729-109-67	s	TRANSISTOR 2SA812-M6
Q3	8-729-100-66	s	TRANSISTOR 2SC1623
Q4	8-729-109-67	s	TRANSISTOR 2SA812-M6
Q5	8-729-100-66	s	TRANSISTOR 2SC1623
Q6	8-729-109-44	s	TRANSISTOR 2SK94
Q7	8-729-109-44	s	TRANSISTOR 2SK94
Q8	8-729-100-66	s	TRANSISTOR 2SC1623
Q9	8-729-113-33	s	TRANSISTOR 2SB733-4
Q10	8-729-140-96	s	TRANSISTOR 2SD774-4
Q11	8-729-105-29	s	TRANSISTOR 2SA1385
Q12	8-729-906-45	s	TRANSISTOR DTA143XK
Q13	8-729-906-45	s	TRANSISTOR DTA143XK
Q14	8-729-920-34	s	TRANSISTOR DTC143XK

Ref. No.	Part No.	SP	Description
R10	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R102	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R103	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R104	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R105	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R106	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R120	1-216-682-11	s	METAL, CHIP 20K 0.5% 1/10W
R121	1-216-682-11	s	METAL, CHIP 20K 0.5% 1/10W
R124	1-216-687-11	s	METAL, CHIP 33K 0.5% 1/10W
R126	1-216-685-11	s	METAL, CHIP 27K 0.5% 1/10W
R127	1-216-673-11	s	METAL, CHIP 8.2K 0.5% 1/10W
R128	1-216-687-11	s	METAL, CHIP 33K 0.5% 1/10W
R129	1-216-677-11	s	METAL, CHIP 12K 0.5% 1/10W
R131	1-216-691-11	s	METAL, CHIP 47K 0.5% 1/10W
R132	1-216-691-11	s	METAL, CHIP 47K 0.5% 1/10W
R133	1-216-687-11	s	METAL, CHIP 33K 0.5% 1/10W
R146	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R147	1-216-661-11	s	METAL, CHIP 2.7K 0.5% 1/10W
R148	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
RB1	1-232-509-00	s	COMPOSITION CIRCUIT BLOCK
RV1	1-228-458-00	s	RES, ADJ, METAL 5K
RV2	1-228-457-00	s	RES, ADJ, METAL 2K
RV3	1-228-474-00	s	RES, ADJ, METAL 10K
RV4	1-228-474-00	s	RES, ADJ, METAL 10K
S1	1-570-610-11	s	SWITCH, TOGGLE
S2	1-570-857-11	s	SWITCH, SLIDE
S3	1-553-252-00	s	SWITCH, DIGITAL
S4	1-553-252-00	s	SWITCH, DIGITAL
S5	1-570-857-11	s	SWITCH, SLIDE
S6	1-570-857-11	s	SWITCH, SLIDE
S7	1-570-857-11	s	SWITCH, SLIDE
S8	1-570-610-11	s	SWITCH, TOGGLE
S9	1-570-598-11	s	SWITCH, DIP 4-CKT
S10	1-572-682-11	s	SWITCH, DIGITAL ROTARY
X1	1-527-941-00	s	VIBRATOR, CRYSTAL 10.944MHz

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Ref.No.	Part No.	SP	Description
AU-98 BOARD			
	A-7513-600-A	o	MOUNTED CIRCUIT BOARD "AU-98"
C1	1-131-365-00	s	TANTALUM 10 10% 16V
C3	1-131-365-00	s	TANTALUM 10 10% 16V
C4	1-124-236-11	s	ELECT 47 20% 16V
C8	1-131-367-00	s	TANTALUM 22 10% 16V
C11	1-124-247-11	s	ELECT 10 20% 35V
C12	1-130-169-11	s	MYLAR 0.22 5% 50V
C13	1-130-169-11	s	MYLAR 0.22 5% 50V
C14	1-124-247-11	s	ELECT 10 20% 35V
C15	1-124-910-11	s	ELECT 47 20% 35V
C16	1-163-123-00	s	CERAMIC 180PF 5% 50V
C17	1-124-247-00	s	ELECT 10 20% 35V
C18	1-124-247-00	s	ELECT 10 20% 35V
C19	1-124-247-00	s	ELECT 10 20% 35V
C20	1-124-247-00	s	ELECT 10 20% 35V
C21	1-163-139-00	s	CERAMIC 820PF 5% 50V
C22	1-124-462-00	s	ELECT 10 20% 16V
C23	1-124-257-00	s	ELECT 2.2 20% 35V
C24	1-124-257-00	s	ELECT 2.2 20% 35V
C25	1-124-257-00	s	ELECT 2.2 20% 35V
C26	1-124-257-00	s	ELECT 2.2 20% 35V
C27	1-130-495-00	s	MYLAR 0.1 5% 50V
C28	1-130-495-00	s	MYLAR 0.1 5% 50V
C29	1-124-462-00	s	ELECT 10 20% 16V
C30	1-124-462-00	s	ELECT 10 20% 16V
C31	1-124-257-00	s	ELECT 2.2 20% 35V
C32	1-124-257-00	s	ELECT 2.2 20% 35V
C33	1-124-257-00	s	ELECT 2.2 20% 35V
C34	1-124-257-00	s	ELECT 2.2 20% 35V
C35	1-124-462-00	s	ELECT 10 20% 16V
C37	1-124-462-00	s	ELECT 10 20% 16V
C42	1-163-117-00	s	CERAMIC 100PF 5% 50V
C43	1-124-236-11	s	ELECT 47 20% 16V
C44	1-124-242-00	s	ELECT 33 20% 16V
C46	1-163-117-00	s	CERAMIC 100PF 5% 50V
C47	1-124-236-11	s	ELECT 47 20% 16V
C48	1-124-242-00	s	ELECT 33 20% 16V
C57	1-124-482-11	s	ELECT 33 20% 35V
C58	1-127-518-11	s	ELECT 100 20% 16V
C61	1-163-139-00	s	CERAMIC 820PF 5% 50V
C62	1-124-462-00	s	ELECT 10 20% 16V
C64	1-163-117-00	s	CERAMIC 100PF 5% 50V
C66	1-124-248-11	s	ELECT 22 20% 35V
C67	1-124-247-11	s	ELECT 10 20% 35V
C68	1-124-910-11	s	ELECT 47 20% 35V
C71	1-124-910-11	s	ELECT 47 20% 35V
C72	1-130-491-11	s	MYLAR 0.047 5% 50V
C73	1-163-109-00	s	CERAMIC 47PF 5% 50V
C76	1-163-109-00	s	CERAMIC 47PF 5% 50V
C77	1-124-910-11	s	ELECT 47 20% 35V
C78	1-124-248-00	s	ELECT 22 20% 35V
C80	1-131-367-00	s	TANTALUM 22 10% 16V
CN1	1-560-747-11	o	RECEPTACLE, 53P, MALE
D1	8-719-815-55	s	1S1555
D2	8-719-100-65	s	RD12EB2
D3	8-719-102-51	s	1SZ51
D10	8-719-815-55	s	1S1555
D11	8-719-815-55	s	1S1555
D12	8-719-815-55	s	1S1555
D13	8-719-815-55	s	1S1555
D14	8-719-815-55	s	1S1555
D15	8-719-815-55	s	1S1555
D16	8-719-815-55	s	1S1555
D17	8-719-815-55	s	1S1555
D18	8-719-100-23	s	1SS123
D19	8-719-815-55	s	1S1555
D20	8-719-100-05	s	1S2837
D21	8-719-100-03	s	1S2835
D22	8-719-815-55	s	1S1555
D23	8-719-100-05	s	1S2837
D24	8-719-100-03	s	1S2835
D25	8-719-100-48	s	RD8.2EB2
D26	8-719-100-05	s	1S2837
D27	8-719-100-03	s	1S2835
D28	8-719-100-03	s	1S2835
D29	8-719-815-55	s	1S1555
D30	8-719-815-55	s	1S1555
D31	8-719-815-55	s	1S1555
D32	8-719-101-23	s	1SS123
D33	8-719-815-55	s	1S1555
D34	8-719-101-23	s	1SS123
D35	8-759-154-33	s	PS2604
D36	8-759-154-33	s	PS2604
D37	8-719-100-23	s	1SS123
IC1	8-759-100-94	s	UPC358G2:NEC
IC2	8-759-981-92	s	RC4558M:RAYTHEON
IC3	8-759-981-86	s	RC4556MA:RAYTHEON
IC4	8-759-981-92	s	RC4558M:RAYTHEON
IC5	8-759-981-86	s	RC4556MA:RAYTHEON
IC6	8-759-981-92	s	RC4558M:RAYTHEON
IC7	8-759-981-86	s	RC4556MA:RAYTHEON
IC8	8-759-981-92	s	RC4558M:RAYTHEON
IC9	8-759-981-92	s	RC4558M:RAYTHEON
IC10	8-759-981-92	s	RC4558M:RAYTHEON

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Ref. No.	Part No.	SP	Description
IC11	8-759-981-92	s	RC4558M:RAYTHEON
IC12	8-759-981-86	s	RC4556MA
IC13	8-759-981-92	s	RC4558M:RAYTHEON
IC14	8-759-009-07	s	MC14053BF:MOTOROLA
IC15	8-759-982-21	s	RC78L05A:RAYTHEON
IC16	8-759-982-21	s	RC78L05A:RAYTHEON
L1	1-408-413-00	s	MICRO 22
L2	1-408-425-00	s	MICRO 220
L3	1-408-421-00	s	MICRO 100
L4	1-408-421-00	s	MICRO 100
L5	1-408-425-00	s	MICRO 220
Q1	8-729-177-44	s	2SD774-5
Q2	8-729-100-75	s	2SA812-M5
Q3	8-729-177-44	s	2SD774-5
Q4	8-729-218-43	s	2SK184-GR
Q5	8-729-177-44	s	2SD774-5
Q6	8-729-177-44	s	2SD774-5
Q7	8-729-100-67	s	2SC1623-L7
Q8	8-729-100-75	s	2SA812-M5
Q9	8-729-218-43	s	2SK184-GR
R6	1-216-683-11	s	METAL 22K 0.50% 1/10W
R7	1-216-673-11	s	METAL 8.2K 0.50% 1/10W
R8	1-249-424-11	s	CARBON 3.9K 5% 1/4W
R10	1-216-683-11	s	METAL 22K 0.50% 1/10W
R11	1-216-683-11	s	METAL 22K 0.50% 1/10W
R14	1-216-681-11	s	METAL 18K 0.50% 1/10W
R15	1-216-681-11	s	METAL 18K 0.50% 1/10W
R16	1-216-688-11	s	METAL 36K 0.50% 1/10W
R18	1-216-681-11	s	METAL 18K 0.50% 1/10W
R19	1-216-677-11	s	METAL 12K 0.50% 1/10W
R20	1-216-684-11	s	METAL 24K 0.50% 1/10W
R22	1-216-681-11	s	METAL 18K 0.50% 1/10W
R23	1-216-674-11	s	METAL 9.1K 0.50% 1/10W
R25	1-249-429-11	s	CARBON 10K 5% 1/4W
R26	1-249-441-11	s	CARBON 100K 5% 1/4W
R27	1-216-677-11	s	METAL 12K 0.50% 1/10W
R28	1-216-675-11	s	METAL 10K 0.50% 1/10W
R31	1-216-683-11	s	METAL 22K 0.50% 1/10W
R33	1-216-683-11	s	METAL 22K 0.50% 1/10W
R34	1-216-683-11	s	METAL 22K 0.50% 1/10W
R36	1-249-411-11	s	CARBON 330 5% 1/4W
R37	1-249-411-11	s	CARBON 330 5% 1/4W
R46	1-216-668-11	s	METAL 5.1K 0.50% 1/10W
R47	1-216-683-11	s	METAL 22K 0.50% 1/10W
R50	1-216-683-11	s	METAL 22K 0.50% 1/10W

Ref. No.	Part No.	SP	Description
R57	1-216-681-11	s	METAL 18K 0.50% 1/10W
R58	1-216-681-11	s	METAL 18K 0.50% 1/10W
R59	1-216-688-11	s	METAL 36K 0.50% 1/10W
R60	1-216-681-11	s	METAL 18K 0.50% 1/10W
R61	1-216-677-11	s	METAL 12K 0.50% 1/10W
R62	1-216-684-11	s	METAL 24K 0.50% 1/10W
R64	1-216-681-11	s	METAL 18K 0.50% 1/10W
R65	1-216-683-11	s	METAL 22K 0.50% 1/10W
R66	1-216-695-11	s	METAL 68K 0.50% 1/10W
R67	1-216-683-11	s	METAL 22K 0.50% 1/10W
R69	1-216-683-11	s	METAL 22K 0.50% 1/10W
R72	1-216-683-11	s	METAL 22K 0.50% 1/10W
R78	1-216-683-11	s	METAL 22K 0.50% 1/10W
R79	1-216-683-11	s	METAL 22K 0.50% 1/10W
R81	1-249-417-11	s	CARBON 1K 5% 1/4W
R82	1-216-662-11	s	METAL 3K 0.50% 1/10W
R85	1-216-683-11	s	METAL 22K 0.50% 1/10W
R86	1-216-683-11	s	METAL 22K 0.50% 1/10W
R87	1-216-662-11	s	METAL 3K 0.50% 1/10W
R90	1-249-429-11	s	CARBON 10K 5% 1/4W
R92	1-249-437-11	s	CARBON 47K 5% 1/4W
R94	1-249-405-11	s	CARBON 100 5% 1/4W
R97	1-216-683-11	s	METAL 22K 0.50% 1/10W
R98	1-216-683-11	s	METAL 22K 0.50% 1/10W
R99	1-216-695-11	s	METAL 68K 0.50% 1/10W
R100	1-216-683-11	s	METAL 22K 0.50% 1/10W
R102	1-216-668-11	s	METAL 5.1K 0.50% 1/10W
R106	1-249-437-11	s	CARBON 47K 5% 1/4W
R107	1-249-405-11	s	CARBON 100 5% 1/4W
R120	1-216-683-11	s	METAL 22K 0.50% 1/10W
R121	1-216-683-11	s	METAL 22K 0.50% 1/10W
R123	1-216-683-11	s	METAL 22K 0.50% 1/10W
R126	1-249-429-11	s	CARBON 10K 5% 1/4W
R128	1-249-433-11	s	CARBON 22K 5% 1/4W
R129	1-249-431-11	s	CARBON 15K 5% 1/4W
R130	1-216-683-11	s	METAL 22K 0.50% 1/10W
R131	1-249-429-11	s	CARBON 10K 5% 1/4W
R132	1-249-435-11	s	CARBON 33K 5% 1/4W
R133	1-249-441-11	s	CARBON 100K 5% 1/4W
R135	1-216-683-11	s	METAL 22K 0.50% 1/10W
R145	1-247-881-00	s	CARBON 120K 5% 1/4W
R146	1-216-679-11	s	METAL 15K 0.50% 1/10W
R147	1-216-693-11	s	METAL 56K 0.50% 1/10W
R149	1-216-693-11	s	METAL 56K 0.50% 1/10W
R150	1-216-693-11	s	METAL 56K 0.50% 1/10W
R151	1-216-693-11	s	METAL 56K 0.50% 1/10W
R153	1-216-627-11	s	METAL 100 0.50% 1/10W
R154	1-216-682-11	s	METAL 20K 0.50% 1/10W
R155	1-216-682-11	s	METAL 20K 0.50% 1/10W
R157	1-216-675-11	s	METAL 10K 0.50% 1/10W

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Ref. No.	Part No.	SP	Description
R158	1-216-694-11	s	METAL 62K 0.50% 1/10W
R159	1-216-646-11	s	METAL 620 0.50% 1/10W
R160	1-216-646-11	s	METAL 620 0.50% 1/10W
R162	1-249-426-11	s	CARBON 5.6K 5% 1/4W S/N UP TO 20130 (FOR UC) S/N UP TO 30020 (FOR EK) S/N UP TO 10135 (FOR J)
R166	1-249-441-11	s	CARBON 100K 5% 1/4W S/N UP TO 20130 (FOR UC) S/N UP TO 30020 (FOR EK) S/N UP TO 10135 (FOR J)
R167	1-249-441-11	s	CARBON 100K 5% 1/4W S/N UP TO 20130 (FOR UC) S/N UP TO 30020 (FOR EK) S/N UP TO 10135 (FOR J)
R168	1-215-431-00	s	METAL 2.7K 1% 1/6W S/N UP TO 20130 (FOR UC) S/N UP TO 30020 (FOR EK) S/N UP TO 10135 (FOR J)
RV1	1-228-456-11	s	CERMET 1K
RV2	1-228-457-11	s	CERMET 2K
RV3	1-228-475-11	s	CERMET 20K
RV4	1-228-475-11	s	CERMET 20K
S1	1-570-857-11	s	SLIDE
S2	1-570-857-11	s	SLIDE
S3	1-570-838-11	s	SLIDE
S4	1-570-850-11	s	SLIDE
S5	1-570-469-11	s	SLIDE
S6	1-554-029-11	s	SLIDE
T2	1-426-038-11	s	600 : 600
T3	1-426-038-11	s	600 : 600
T4	1-426-038-11	s	600 : 600
T5	1-448-224-11	s	DC-DC CONVERTER

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Ref. No.	Part No.	SP	Description

EN-64 BOARD			

	A-7513-602-A	o	MOUNTED CIRCUIT BOARD "EN-64" (UC)
	A-7515-002-A	o	MOUNTED CIRCUIT BOARD "EN-64J" (J)
	1-562-579-21	s	RECEPTACLE, 2P
	1-562-579-21	s	RECEPTACLE, 2P
	1-562-579-21	s	RECEPTACLE, 2P
C18	1-102-960-00	s	CERAMIC 24PF 5% 50V
C19	1-102-960-00	s	CERAMIC 24PF 5% 50V
C20	1-162-879-11	s	CERAMIC 100PF 5% 50V
C25	1-162-673-11	s	CERAMIC 33PF 5% 50V
C26	1-162-762-11	s	CERAMIC 560PF 5% 50V
C27	1-162-756-11	s	CERAMIC 180PF 5% 50V
C32	1-162-747-11	s	CERAMIC 56PF 5% 50V
C33	1-162-881-11	s	CERAMIC 150PF 5% 50V
C57	1-102-851-11	s	CERAMIC 15PF 5% 50V
C58	1-107-039-11	s	CERAMIC 1.2PF 0.5PF 500V
C65	1-127-517-11	s	ELECT 150 16V
C67	1-102-934-00	s	CERAMIC 1PF 0.25PF 50V
C68	1-102-934-00	s	CERAMIC 1PF 0.25PF 50V
C72	1-102-934-00	s	CERAMIC 1PF 0.25PF 50V
C73	1-102-934-00	s	CERAMIC 1PF 0.25PF 50V
C76	1-131-367-21	s	TANTALUM 22 10% 16V
C77	1-131-367-21	s	TANTALUM 22 10% 16V
C78	1-102-934-00	s	CERAMIC 1PF 0.25PF 50V
C79	1-102-934-00	s	CERAMIC 1PF 0.25PF 50V
C81	1-131-365-00	s	TANTALUM 10 10% 16V
C82	1-131-367-21	s	TANTALUM 22 10% 16V
C83	1-131-367-21	s	TANTALUM 22 10% 16V
C84	1-162-674-11	s	CERAMIC 39PF 5% 50V
C85	1-162-720-11	s	CERAMIC 270PF 5% 50V
C93	1-162-942-00	s	CERAMIC 5PF 5% 50V
C95	1-102-934-00	s	CERAMIC 1PF 0.25PF 50V
C96	1-102-934-00	s	CERAMIC 1PF 0.25PF 50V
C99	1-161-485-00	s	CERAMIC 0.1 50V

Ref. No.	Part No.	SP	Description
C100	1-161-485-00	s	CERAMIC 0.1 50V
C101	1-102-934-00	s	CERAMIC 1PF 0.25PF 50V
C102	1-102-934-00	s	CERAMIC 1PF 0.25PF 50V
C105	1-161-485-00	s	CERAMIC 0.1 50V
C106	1-161-485-00	s	CERAMIC 0.1 50V
C108	1-102-942-00	s	CERAMIC 5PF 5% 50V
C110	1-102-934-00	s	CERAMIC 1PF 0.25PF 50V
C111	1-102-934-00	s	CERAMIC 1PF 0.25PF 50V
C114	1-161-485-00	s	CERAMIC 0.1 50V
C115	1-161-485-00	s	CERAMIC 0.1 50V
C206	1-102-934-00	s	CERAMIC 1PF 0.25PF 50V
C207	1-102-934-00	s	CERAMIC 1PF 0.25PF 50V
C210	1-161-485-00	s	CERAMIC 0.1 50V
C211	1-161-485-00	s	CERAMIC 0.1 50V
C212	1-162-720-11	s	CERAMIC 270PF 5% 50V
C213	1-162-674-11	s	CERAMIC 39PF 5% 50V
C218	1-124-119-11	s	ELECT 330 20% 16V
C219	1-131-365-00	s	TANTALUM 10 10% 16V
C220	1-131-365-00	s	TANTALUM 10 10% 16V
C221	1-131-365-00	s	TANTALUM 10 10% 16V
C226	1-102-935-00	s	CERAMIC 2PF 0.50PF 50V
C227	1-102-934-00	s	CERAMIC 1PF 0.25PF 50V
C228	1-131-365-00	s	TANTALUM 10 10% 16V
C230	1-161-485-00	s	CERAMIC 0.1 50V
C231	1-161-485-00	s	CERAMIC 0.1 50V
C236	1-162-737-11	s	CERAMIC 10PF 5% 50V
C240	1-102-945-00	s	CERAMIC 8PF 0.50PF 50V
C241	1-102-943-00	s	CERAMIC 6PF 0.50PF 50V
C242	1-163-088-00	s	CERAMIC 5PF 0.25PF 50V
C244	1-161-485-00	s	CERAMIC 0.1 50V
C245	1-161-485-00	s	CERAMIC 0.1 50V
C246	1-161-485-00	s	CERAMIC 0.1 50V
CN1	1-560-747-11	o	RECEPTACL, 53P, MALE
D1	8-719-100-41	s	RD6.8EB2
D2	8-719-100-41	s	RD6.8EB2
D3	8-719-102-51	s	1SZ51
D4	8-719-100-41	s	RD6.8EB2
D5	8-719-100-03	s	1S2835

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Ref. No.	Part No.	SP	Description
D6	8-719-100-03	s	1S2835
D7	8-719-100-03	s	1S2835
D8	8-719-100-05	s	1S2837
D9	8-719-100-05	s	1S2837
D10	8-719-100-03	s	1S2835
D11	8-719-100-03	s	1S2835
D12	8-719-100-05	s	1S2837
D13	8-719-100-05	s	1S2837
D14	8-719-100-05	s	1S2837
D15	8-719-100-03	s	1S2835
D16	8-719-100-03	s	1S2835
D17	8-719-100-03	s	1S2835
D19	8-719-100-03	s	1S2835
DL1	1-415-290-11	s	0.41us ±10ns
DL3	1-415-291-11	s	790ns ±10ns
FL1	1-235-161-12	s	BAND PASS, 3.58MHz
IC1	8-759-906-54	s	TL064CNS:TI
IC2	8-759-906-59	s	CX22017:SONY
IC4	8-759-911-77	s	CX-7968A:SONY
IC5	8-759-008-74	s	MC14001BF:MOTOROLA
IC6	8-759-008-79	s	MC14011BF:MOTOROLA
IC7	8-759-250-20	s	TC5020BP:TOSHIBA
IC8	8-759-008-82	s	MC14013BF:MOTOROLA
IC9	8-759-785-28	s	27C64-25-C35ENC1.00:FUJITSU
IC10	8-759-204-90	s	TC40H374F:TOSHIBA
IC11	8-759-981-86	s	RC4556MA:RAYTHEON
IC12	8-759-939-68	s	TL062ACPS:TI
L1	1-408-413-21	s	MICRO 22
L2	1-408-413-21	s	MICRO 22
L3	1-408-849-11	s	MICRO 330
L4	1-408-851-11	s	MICRO 560
L5	1-408-413-21	s	MICRO 22
L6	1-408-413-21	s	MICRO 22
L7	1-408-413-21	s	MICRO 22
L8	1-408-413-21	s	MICRO 22
L9	1-408-413-21	s	MICRO 22
L10	1-408-413-21	s	MICRO 22

Ref. No.	Part No.	SP	Description
L11	1-408-409-21	s	MICRO 10
L12	1-408-413-21	s	MICRO 22
L14	1-408-413-21	s	MICRO 22
L15	1-408-413-21	s	MICRO 22
L16	1-408-413-21	s	MICRO 22
L17	1-408-413-21	s	MICRO 22
L18	1-408-413-21	s	MICRO 22
L19	1-408-413-21	s	MICRO 22
L20	1-408-413-21	s	MICRO 22
L21	1-408-145-11	s	19
L22	1-408-413-21	s	MICRO 22
L23	1-408-413-21	s	MICRO 22
LV1	1-408-844-11	s	22
LV2	1-408-844-11	s	22
LV3	1-408-844-11	s	22
Q1	8-729-113-32	s	2SB733
Q2	8-729-177-32	s	2SD773-3
Q3	8-729-113-32	s	2SB733
Q4	8-729-100-67	s	2SC1623-L7
Q5	8-729-100-67	s	2SC1623-L7
Q6	8-729-100-67	s	2SC1623-L7
Q7	8-729-100-67	s	2SC1623-L7
Q8	8-729-100-67	s	2SC1623-L7
Q9	8-729-100-67	s	2SC1623-L7
Q10	8-729-100-67	s	2SC1623-L7
Q11	8-729-100-67	s	2SC1623-L7
Q12	8-729-100-67	s	2SC1623-L7
Q13	8-729-100-67	s	2SC1623-L7
Q14	8-729-100-75	s	2SA812-M5
Q15	8-729-100-67	s	2SC1623-L7
Q16	8-729-200-87	s	2SC2714Y
Q17	8-729-122-63	s	2SA1226
Q18	8-729-101-25	s	2SC1009A
Q19	8-729-101-25	s	2SC1009A
Q20	8-729-100-67	s	2SC1623-L7
Q21	8-729-101-25	s	2SC1009A
Q22	8-729-312-22	s	2SA1122
Q23	8-729-312-22	s	2SA1122
Q24	8-729-312-22	s	2SA1122
Q25	8-729-312-22	s	2SA1122

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Ref. No.	Part No.	SP	Description
Q26	8-729-312-22	s	2SA1122
Q27	8-729-312-22	s	2SA1122
Q28	8-729-100-67	s	2SC1623-L7
Q29	8-729-100-67	s	2SC1623-L7
Q30	8-729-100-67	s	2SC1623-L7
Q31	8-729-100-67	s	2SC1623-L7
Q32	8-729-100-67	s	2SC1623-L7
Q33	8-729-100-67	s	2SC1623-L7
Q34	8-729-200-87	s	2SC2714Y
Q35	8-729-200-87	s	2SC2714Y
Q36	8-729-200-87	s	2SC2714Y
Q37	8-729-312-22	s	2SA1122
Q38	8-729-200-87	s	2SC2714Y
Q39	8-729-312-22	s	2SA1122
Q40	8-729-100-67	s	2SC1623-L7
Q41	8-729-200-87	s	2SC2714Y
Q42	8-729-312-22	s	2SA1122
Q43	8-729-312-22	s	2SA1122
Q44	8-729-200-87	s	2SC2714Y
Q45	8-729-312-22	s	2SA1122
Q46	8-729-200-87	s	2SC2714Y
Q47	8-729-122-63	s	2SA1226
Q48	8-729-200-87	s	2SC2714Y
Q49	8-729-122-63	s	2SA1226
Q50	8-729-200-87	s	2SC2714Y
Q51	8-729-312-22	s	2SA1122
Q52	8-729-200-87	s	2SC2714Y
Q53	8-729-122-63	s	2SA1226
Q54	8-729-200-87	s	2SC2714Y
Q55	8-729-122-63	s	2SA1226
Q56	8-729-312-22	s	2SA1122
Q57	8-729-100-67	s	2SC1623-L7
Q58	8-729-312-22	s	2SA1122
Q59	8-729-312-22	s	2SA1122
Q60	8-729-312-22	s	2SA1122
Q61	8-729-200-87	s	2SC2714Y
Q62	8-729-200-87	s	2SC2714Y
Q63	8-729-200-87	s	2SC2714Y
Q64	8-729-312-22	s	2SA1122
Q65	8-729-312-22	s	2SA1122
Q66	8-729-200-87	s	2SC2714Y
Q67	8-729-312-22	s	2SA1122
Q68	8-729-200-87	s	2SC2714Y
Q69	8-729-122-63	s	2SA1226
Q70	8-729-312-22	s	2SA1122
Q71	8-729-200-87	s	2SC2714Y
Q72	8-729-122-63	s	2SA1226
Q73	8-729-312-22	s	2SA1122
Q74	8-729-200-87	s	2SC2714Y
Q75	8-729-312-22	s	2SA1122

Ref. No.	Part No.	SP	Description
Q76	8-729-200-87	s	2SC2714Y
Q77	8-729-312-22	s	2SA1122
Q78	8-729-312-22	s	2SA1122
Q79	8-729-200-87	s	2SC2714Y
Q80	8-729-122-63	s	2SA1226
Q81	8-729-200-87	s	2SC2714Y
Q82	8-729-200-87	s	2SC2714Y
Q83	8-729-200-87	s	2SC2714Y
Q84	8-729-312-22	s	2SA1122
Q85	8-729-312-22	s	2SA1122
Q86	8-729-200-87	s	2SC2714Y
Q87	8-729-312-22	s	2SA1122
Q88	8-729-200-87	s	2SC2714Y
Q89	8-729-122-63	s	2SA1226
Q90	8-729-312-22	s	2SA1122
Q91	8-729-200-87	s	2SC2714Y
Q92	8-729-122-63	s	2SA1226
Q93	8-729-100-67	s	2SC1623-L7
Q94	8-729-100-67	s	2SC1623-L7
Q95	8-729-100-67	s	2SC1623-L7
Q96	8-729-100-67	s	2SC1623-L7
Q97	8-729-100-67	s	2SC1623-L7
Q98	8-729-312-22	s	2SA1122
Q99	8-729-312-22	s	2SA1122
Q100	8-729-312-22	s	2SA1122
Q101	8-729-312-22	s	2SA1122
Q102	8-729-312-22	s	2SA1122
Q103	8-729-312-22	s	2SA1122
Q104	8-769-401-68	s	3SK163-2
Q105	8-729-100-67	s	2SC1623-L7
Q106	8-769-401-68	s	3SK163-2
Q107	8-729-200-87	s	2SC2714Y
Q108	8-729-200-87	s	2SC2714Y
Q109	8-729-200-87	s	2SC2714Y
Q110	8-769-401-68	s	3SK163-2
Q111	8-729-312-22	s	2SA1122
Q112	8-729-312-22	s	2SA1122
Q113	8-729-312-22	s	2SA1122
Q114	8-729-312-22	s	2SA1122
Q115	8-729-200-87	s	2SC2714Y
Q116	8-729-200-87	s	2SC2714Y
Q117	8-729-312-22	s	2SA1122
Q118	8-729-200-87	s	2SC2714Y
Q119	8-729-122-63	s	2SA1226
Q120	8-729-312-22	s	2SA1122
Q121	8-729-200-87	s	2SC2714Y
Q122	8-729-122-63	s	2SA1226
Q123	8-729-100-75	s	2SA812-M5
Q124	8-729-100-67	s	2SC1623-L7
Q125	8-729-312-22	s	2SA1122

Parts that are not listed in the "reference number order list" are shown in the "General Purpose Electrical Parts List".

Ref.No.	Part No.	SP	Description
Q126	8-729-312-22	s	2SA1122
Q127	8-729-100-67	s	2SC1623-L7
Q128	8-729-100-67	s	2SC1623-L7
Q129	8-729-100-75	s	2SA812-M5
Q130	8-729-100-75	s	2SA812-M5
Q131	8-729-312-22	s	2SA1122
Q132	8-729-312-22	s	2SA1122
Q133	8-729-312-22	s	2SA1122
Q134	8-729-312-22	s	2SA1122
Q135	8-729-312-22	s	2SA1122
Q136	8-729-312-22	s	2SA1122
Q137	8-729-312-22	s	2SA1122
Q138	8-729-312-22	s	2SA1122
Q139	8-729-200-87	s	2SC2714Y
Q140	8-729-200-87	s	2SC2714Y
Q141	8-729-200-87	s	2SC2714Y
Q142	8-729-200-87	s	2SC2714Y
Q143	8-729-312-22	s	2SA1122
Q144	8-729-200-87	s	2SC2714Y
Q145	8-729-122-63	s	2SA1226
Q146	8-729-312-22	s	2SA1122
Q147	8-729-200-87	s	2SC2714Y
Q148	8-729-122-63	s	2SA1226
Q149	8-729-100-75	s	2SA812-M5
Q150	8-729-100-67	s	2SC1623-L7
Q151	8-769-401-68	s	3SK163-2
Q152	8-769-401-68	s	3SK163-2
R2	1-216-683-11	s	METAL 22k 0.50% 1/10W
R3	1-216-691-11	s	METAL 47k 0.50% 1/10W
R4	1-216-655-11	s	METAL 1.5k 0.50% 1/10W
R5	1-216-675-11	s	METAL 10k 0.50% 1/10W
R6	1-216-683-11	s	METAL 22k 0.50% 1/10W
R7	1-216-683-11	s	METAL 22K 0.50% 1/10W
R9	1-216-677-11	s	METAL 12K 0.50% 1/10W
R10	1-216-679-11	s	METAL 15K 0.50% 1/10W
R11	1-216-652-11	s	METAL 1.1K 0.50% 1/10W
R12	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R13	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R14	1-216-683-11	s	METAL 22K 0.50% 1/10W
R15	1-216-683-11	s	METAL 22K 0.50% 1/10W
R16	1-216-676-11	s	METAL 11K 0.50% 1/10W
R17	1-216-658-11	s	METAL 2K 0.50% 1/10W
R18	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R19	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R20	1-216-683-11	s	METAL 22K 0.50% 1/10W
R21	1-216-683-11	s	METAL 22K 0.50% 1/10W
R22	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R23	1-216-677-11	s	METAL 12K 0.50% 1/10W
R24	1-216-658-11	s	METAL 2K 0.50% 1/10W
R26	1-216-643-11	s	METAL 470 0.50% 1/10W
R27	1-216-644-11	s	METAL 510 0.50% 1/10W
R28	1-216-683-11	s	METAL 22K 0.50% 1/10W
R29	1-216-659-11	s	METAL 2.2K 0.50% 1/10W
R30	1-216-654-11	s	METAL 1.3K 0.50% 1/10W
R31	1-216-675-11	s	METAL 10K 0.50% 1/10W
R32	1-216-680-11	s	METAL 16K 0.50% 1/10W
R35	1-216-659-11	s	METAL 2.2K 0.50% 1/10W
R38	1-216-685-11	s	METAL 27K 0.50% 1/10W
R39	1-216-652-11	s	METAL 1.1K 0.50% 1/10W
R42	1-216-664-11	s	METAL 3.6K 0.50% 1/10W
R45	1-216-677-11	s	METAL 12K 0.50% 1/10W
R46	1-216-680-11	s	METAL 16K 0.50% 1/10W
R48	1-216-644-11	s	METAL 510 0.50% 1/10W
R49	1-216-666-11	s	METAL 4.3K 0.50% 1/10W
R50	1-216-644-11	s	METAL 510 0.50% 1/10W
R52	1-216-683-11	s	METAL 22K 0.50% 1/10W
R53	1-216-677-11	s	METAL 12K 0.50% 1/10W
R55	1-216-645-11	s	METAL 560 0.50% 1/10W
R57	1-216-683-11	s	METAL 22K 0.50% 1/10W
R58	1-216-677-11	s	METAL 12K 0.50% 1/10W
R60	1-216-645-11	s	METAL 560 0.50% 1/10W
R66	1-216-651-11	s	METAL 1K 0.50% 1/10W
R67	1-216-649-11	s	METAL 820 0.50% 1/10W
R92	1-216-666-11	s	METAL 4.3K 0.50% 1/10W
R93	1-216-683-11	s	METAL 22K 0.50% 1/10W
R94	1-216-683-11	s	METAL 22K 0.50% 1/10W
R95	1-216-655-11	s	METAL 1.5K 0.50% 1/10W
R96	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R97	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R101	1-216-644-11	s	METAL 510 0.50% 1/10W
R102	1-214-581-11	s	METAL 10K 1% 1/8W
R104	1-216-641-11	s	METAL 390 0.50% 1/10W
R108	1-216-656-11	s	METAL 1.6K 0.50% 1/10W
R109	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R113	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R115	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R116	1-216-666-11	s	METAL 4.3K 0.50% 1/10W
R120	1-216-654-11	s	METAL 1.3K 0.50% 1/10W
R121	1-216-669-11	s	METAL 5.6K 0.50% 1/10W
R122	1-216-699-11	s	METAL 100K 0.50% 1/10W
R123	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R125	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R126	1-216-665-11	s	METAL 3.9K 0.50% 1/10W
R134	1-216-624-11	s	METAL 75 0.50% 1/10W
R135	1-216-654-11	s	METAL 1.3K 0.50% 1/10W
R136	1-216-629-11	s	METAL 120 0.50% 1/10W
R137	1-216-669-11	s	METAL 5.6K 0.50% 1/10W

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Ref.No.	Part No.	SP	Description
R138	1-216-627-11	s	METAL 100 0.50% 1/10W
R140	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R142	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R143	1-216-665-11	s	METAL 3.9K 0.50% 1/10W
R151	1-216-624-11	s	METAL 75 0.50% 1/10W
R153	1-216-644-11	s	METAL 510 0.50% 1/10W
R154	1-216-644-11	s	METAL 510 0.50% 1/10W
R156	1-216-666-11	s	METAL 4.3K 0.50% 1/10W
R168	1-216-675-11	s	METAL 10K 0.50% 1/10W
R169	1-216-675-11	s	METAL 10K 0.50% 1/10W
R170	1-216-679-11	s	METAL 15K 0.50% 1/10W
R171	1-216-679-11	s	METAL 15K 0.50% 1/10W
R172	1-216-679-11	s	METAL 15K 0.50% 1/10W
R173	1-216-682-11	s	METAL 20K 0.50% 1/10W
R174	1-216-682-11	s	METAL 20K 0.50% 1/10W
R175	1-216-682-11	s	METAL 20K 0.50% 1/10W
R176	1-216-661-11	s	METAL 2.7K 0.50% 1/10W
R177	1-216-661-11	s	METAL 2.7K 0.50% 1/10W
R178	1-216-661-11	s	METAL 2.7K 0.50% 1/10W
R179	1-216-675-11	s	METAL 10K 0.50% 1/10W
R187	1-216-658-11	s	METAL 2K 0.50% 1/10W
R188	1-216-651-11	s	METAL 1K 0.50% 1/10W
R189	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R190	1-216-669-11	s	METAL 5.6K 0.50% 1/10W
R192	1-216-651-11	s	METAL 1K 0.50% 1/10W
R193	1-216-651-11	s	METAL 1K 0.50% 1/10W
R195	1-214-567-11	s	METAL 2.7K 1% 1/8W
R196	1-216-668-11	s	METAL 5.1K 0.50% 1/10W
R197	1-216-675-11	s	METAL 10K 0.50% 1/10W
R198	1-216-675-11	s	METAL 10K 0.50% 1/10W
R199	1-216-675-11	s	METAL 10K 0.50% 1/10W
R201	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R202	1-216-673-11	s	METAL 8.2K 0.50% 1/10W
R203	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R204	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R206	1-216-677-11	s	METAL 12K 0.50% 1/10W
R207	1-216-682-11	s	METAL 20K 0.50% 1/10W
R213	1-216-624-11	s	METAL 75 0.50% 1/10W
R214	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R215	1-216-661-11	s	METAL 2.7K 0.50% 1/10W
R216	1-214-593-11	s	METAL 33K 1% 1/8W
R217	1-216-072-00	s	CHIP 9.1K 5% 1/10W
R219	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R220	1-216-673-11	s	METAL 8.2K 0.50% 1/10W
R221	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R223	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R225	1-216-677-11	s	METAL 12K 0.50% 1/10W
R232	1-216-624-11	s	METAL 75 0.50% 1/10W
R233	1-216-658-11	s	METAL 2K 0.50% 1/10W
R234	1-216-651-11	s	METAL 1K 0.50% 1/10W
R235	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R236	1-216-669-11	s	METAL 5.6K 0.50% 1/10W
R237	1-216-651-11	s	METAL 1K 0.50% 1/10W
R240	1-214-567-11	s	METAL 2.7K 1% 1/8W
R241	1-216-668-11	s	METAL 5.1K 0.50% 1/10W

Ref.No.	Part No.	SP	Description
R242	1-216-675-11	s	METAL 10K 0.50% 1/10W
R243	1-216-675-11	s	METAL 10K 0.50% 1/10W
R244	1-216-675-11	s	METAL 10K 0.50% 1/10W
R246	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R247	1-216-673-11	s	METAL 8.2K 0.50% 1/10W
R248	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R249	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R251	1-216-677-11	s	METAL 12K 0.50% 1/10W
R252	1-216-682-11	s	METAL 20K 0.50% 1/10W
R258	1-216-624-11	s	METAL 75 0.50% 1/10W
R259	1-216-659-11	s	METAL 2.2K 0.50% 1/10W
R286	1-216-639-11	s	METAL 330 0.50% 1/10W
R293	1-216-639-11	s	METAL 330 0.50% 1/10W
R300	1-216-639-11	s	METAL 330 0.50% 1/10W
R309	1-216-653-11	s	METAL 1.2K 0.50% 1/10W
R312	1-216-651-11	s	METAL 1K 0.50% 1/10W
R314	1-216-666-11	s	METAL 4.3K 0.50% 1/10W
R315	1-216-669-11	s	METAL 5.6K 0.50% 1/10W
R316	1-216-659-11	s	METAL 2.2K 0.50% 1/10W
R317	1-216-651-11	s	METAL 1K 0.50% 1/10W
R318	1-216-651-11	s	METAL 1K 0.50% 1/10W
R319	1-216-651-11	s	METAL 1K 0.50% 1/10W
R320	1-216-653-11	s	METAL 1.2K 0.50% 1/10W
R321	1-216-651-11	s	METAL 1K 0.50% 1/10W
R323	1-216-676-11	s	METAL 11K 0.50% 1/10W
R324	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R325	1-216-672-11	s	METAL 7.5K 0.50% 1/10W
R326	1-216-675-11	s	METAL 10K 0.50% 1/10W
R328	1-216-674-11	s	METAL 9.1K 0.50% 1/10W
R330	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R331	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R335	1-216-673-11	s	METAL 8.2K 0.50% 1/10W
R336	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R337	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R339	1-216-675-11	s	METAL 10K 0.50% 1/10W
R340	1-216-682-11	s	METAL 20K 0.50% 1/10W
R346	1-216-624-11	s	METAL 75 0.50% 1/10W
R349	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R350	1-216-673-11	s	METAL 8.2K 0.50% 1/10W
R352	1-216-644-11	s	METAL 510 0.50% 1/10W
R354	1-216-644-11	s	METAL 510 0.50% 1/10W
R362	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R363	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R367	1-216-677-11	s	METAL 12K 0.50% 1/10W
R368	1-216-684-11	s	METAL 24K 0.50% 1/10W
R369	1-216-681-11	s	METAL 18K 0.50% 1/10W

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Ref. No.	Part No.	SP	Description
R370	1-216-678-11	s	METAL 13K 0.50% 1/10W
R371	1-216-666-11	s	METAL 4.3K 0.50% 1/10W
R373	1-216-696-11	s	METAL 75K 0.50% 1/10W
R389	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R390	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R394	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R395	1-216-673-11	s	METAL 8.2K 0.50% 1/10W
R396	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R397	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R399	1-216-675-11	s	METAL 10K 0.50% 1/10W
R400	1-216-682-11	s	METAL 20K 0.50% 1/10W
R407	1-216-624-11	s	METAL 75 0.50% 1/10W
R424	1-216-671-11	s	METAL 6.8K 0.50% 1/10W
R425	1-216-674-11	s	METAL 9.1K 0.50% 1/10W
R426	1-216-675-11	s	METAL 10K 0.50% 1/10W
R427	1-216-686-11	s	METAL 30K 0.50% 1/10W
R428	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R429	1-216-682-11	s	METAL 20K 0.50% 1/10W
R430	1-216-651-11	s	METAL 1K 0.50% 1/10W
R432	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R434	1-216-671-11	s	METAL 6.8K 0.50% 1/10W
R443	1-216-662-11	s	METAL 3K 0.50% 1/10W
R444	1-249-423-11	s	CARBON 3.3K 5% 1/4W
R445	1-249-425-11	s	CARBON 4.7K 5% 1/4W
R446	1-216-681-11	s	METAL 18K 0.50% 1/10W
R448	1-216-025-11	s	CARBON 100 5% 1/10W
RB1	1-239-024-11	s	MATRIX
RB2	1-239-025-11	s	MATRIX
RB3	1-239-026-11	s	MATRIX
RB5	1-239-028-11	s	MATRIX
RB6	1-239-027-11	s	MATRIX
RV1	1-228-456-11	s	CERMET 1K
RV2	1-228-455-11	s	CERMET 500
RV3	1-228-458-11	s	CERMET 5K
RV4	1-228-455-11	s	CERMET 500
RV5	1-230-749-21	s	CERMET 5K
RV6	1-230-749-21	s	CERMET 5K
RV7	1-228-469-11	s	CERMET 200
RV8	1-228-468-11	s	CERMET 100
RV9	1-228-454-11	s	CERMET 200
RV11	1-228-471-11	s	CERMET 1K

Ref. No.	Part No.	SP	Description
RV12	1-228-455-11	s	CERMET 500
RV13	1-228-455-11	s	CERMET 500
RV14	1-228-455-11	s	CERMET 500
RV15	1-228-455-11	s	CERMET 500
RV16	1-228-456-11	s	CERMET 1K
RV17	1-228-455-11	s	CERMET 500
RV18	1-228-456-11	s	CERMET 1K
RV19	1-228-455-11	s	CERMET 500
RV20	1-228-456-11	s	CERMET 1K
RV21	1-228-456-11	s	CERMET 1K
RV22	1-228-458-11	s	CERMET 5K
RV24	1-228-458-11	s	CERMET 5K
RV25	1-228-459-11	s	CERMET 10K
RV26	1-228-459-11	s	CERMET 10K
RV27	1-228-460-11	s	CERMET 20K
RV28	1-228-458-11	s	CERMET 5K
RV29	1-228-454-11	s	CERMET 200
RV30	1-228-458-11	s	CERMET 5K
RV31	1-237-037-11	s	CERMET 20K
RV32	1-237-037-11	s	CERMET 20K
S1	1-570-857-11	s	SLIDE
S2	1-570-857-11	s	SLIDE
S3	1-570-850-11	s	SLIDE
S4	1-570-857-11	s	SLIDE
S5	1-570-857-11	s	SLIDE
S6	1-570-857-11	s	SLIDE

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Ref.No.	Part No.	SP	Description

			SG-131 BOARD

	A-7513-605-A	o	MOUNTED CIRCUIT BOARD "SG-131"
C1	1-127-512-11	s	ELECT 10 20% 25V
C3	1-127-487-11	s	ELECT 4.7 20% 10V
C6	1-127-491-00	s	ELECT 22 20% 6.3V
C9	1-127-516-11	s	ELECT 220 20% 10V
C10	1-127-489-11	s	ELECT 10 20% 10V
C11	1-127-512-00	s	ELECT 10 20% 16V
C12	1-127-489-11	s	ELECT 10 20% 10V
C14	1-163-033-00	s	CERAMIC 0.022 10%25V
C15	1-127-515-11	s	ELECT 47 20% 10V
C16	1-127-489-11	s	ELECT 10 20% 10V
C21	1-163-115-00	s	CERAMIC 82PF 5% 50V
C23	1-127-512-11	s	ELECT 10 20% 25V
C24	1-127-512-00	s	ELECT 10 20% 16V
C25	1-127-489-11	s	ELECT 10 20% 10V
C26	1-127-489-11	s	ELECT 10 20% 10V
C27	1-162-875-21	s	CERAMIC 68PF 5% 50V
C28	1-127-512-11	s	ELECT 10 20% 25V
C29	1-127-512-11	s	ELECT 10 20% 25V
C33	1-127-518-11	s	ELECT 100 20% 16V
C34	1-127-518-11	s	ELECT 100 20% 16V
C35	1-127-512-00	s	ELECT 10 20% 16V
C36	1-127-489-11	s	ELECT 10 20% 10V
C37	1-127-489-11	s	ELECT 10 20% 10V
C38	1-127-489-11	s	ELECT 10 20% 10V
C40	1-127-489-11	s	ELECT 10 20% 10V
C42	1-127-489-11	s	ELECT 10 20% 10V
C43	1-127-489-11	s	ELECT 10 20% 10V
C46	1-161-041-00	s	CERAMIC 0.0015 10% 25V
C47	1-127-489-11	s	ELECT 10 20% 10V
C50	1-161-049-00	s	CERAMIC 0.0068 10% 25V
C52	1-162-718-11	s	CERAMIC 220PF 5% 50V
C53	1-162-718-11	s	CERAMIC 220PF 5% 50V
C56	1-127-489-11	s	ELECT 10 20% 10V
C59	1-127-489-11	s	ELECT 10 20% 10V
C60	1-127-489-11	s	ELECT 10 20% 10V
C62	1-127-489-11	s	ELECT 10 20% 10V
C63	1-162-718-11	s	CERAMIC 220PF 5% 50V
C64	1-127-489-11	s	ELECT 10 20% 10V
C65	1-127-489-11	s	ELECT 10 20% 10V
C67	1-163-107-00	s	CERAMIC 39PF 5% 50V
C72	1-127-512-00	s	ELECT 10 20% 16V
C73	1-127-489-11	s	ELECT 10 20% 10V
C75	1-163-710-11	s	CERAMIC 100PF 5% 50V
C77	1-130-480-00	s	CERAMIC 5600PF 5% 50V
C78	1-102-116-00	s	CERAMIC 680PF 10% 50V
C79	1-161-043-00	s	CERAMIC 0.0022 10% 25V
C81	1-127-489-11	s	ELECT 10 20% 10V
C82	1-127-489-11	s	ELECT 10 20% 10V
C83	1-127-491-11	s	ELECT 22 20% 10V
C85	1-127-489-11	s	ELECT 10 20% 10V

Ref.No.	Part No.	SP	Description
C87	1-127-489-11	s	ELECT 10 20% 10V
C90	1-127-489-11	s	ELECT 10 20% 10V
C92	1-127-496-11	s	ELECT 6.8 20% 16V
C93	1-163-099-00	s	CERAMIC 18PF 5% 50V
C94	1-127-512-00	s	ELECT 10 20% 16V
C96	1-127-496-11	s	ELECT 6.8 20% 16V
C100	1-127-489-11	s	ELECT 10 20% 10V
C107	1-127-512-00	s	ELECT 10 20% 16V
C108	1-163-105-00	s	CERAMIC 33PF 5% 50V
C114	1-127-512-11	s	ELECT 10 20% 25V
CN1	1-560-747-11	o	RECEPTACLE, 53P, MALE
CP1	1-567-085-11	s	CRYSTAL, 14.31818MHz
CP2	1-567-084-12	s	CRYSTAL, 14.31818MHz
D1	8-719-981-00	s	ERB81-004
D2	8-719-100-03	s	1S2835
			S/N 20201 AND HIGHER (UC)
			S/N 30101 AND HIGHER (EK)
			S/N 10201 AND HIGHER (J)
D4	8-719-100-03	s	1S2835
D5	8-719-100-41	s	RD6.8EB2
D6	8-719-100-41	s	RD6.8EB2
D7	8-719-101-23	s	1SS123
D8	8-719-101-23	s	1SS123
D9	8-719-100-03	s	1S2835
			S/N UP TO 20130 (UC)
			S/N UP TO 30020 (EK)
			S/N UP TO 10135 (J)
D10	8-719-100-03	s	1S2835
D11	8-719-101-23	s	1SS123
D12	8-719-101-23	s	1SS123
D13	8-719-101-23	s	1SS123
D14	8-719-100-05	s	1S2837
D15	8-719-100-05	s	1S2837
D16	8-719-100-05	s	1S2837
D17	8-719-101-23	s	1SS123
D30	8-719-812-33	s	TLG123A:TOSHIBA
D31	8-719-812-33	s	TLG123A:TOSHIBA
D32	8-719-100-03	s	1S2835
			S/N UP TO 20130 (UC)
			S/N UP TO 30020 (EK)
			S/N UP TO 10135 (EK)

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Ref. No.	Part No.	SP	Description
FL1	1-235-572-11	s	L. P. F. 4. 43MHz
IC1	8-759-908-95	s	TL1451CNS:TI
IC2	8-759-101-12	s	UPC311G2:NEC
IC3	8-759-939-68	s	TL062ACPS:TI
IC4	8-752-335-47	s	CXD1216M:SONY
IC5	8-759-939-68	s	TL062ACPS:TI
IC6	8-759-009-07	s	MC14053BF:MOTOROLA
IC7	8-759-907-81	s	SN74LS221NS:TI
IC8	8-759-939-68	s	TL062ACPS:TI
IC9	8-759-982-21	s	RC78L05A:RAYTHEON
IC10	8-759-204-96	s	TC74HC04F:TOSHIBA
IC11	8-759-927-46	s	SN74HC00ANS:TI
IC12	8-759-239-58	s	TC74HC221AF:TOSHIBA
IC13	8-759-204-96	s	TC74HC04F:TOSHIBA
IC14	8-759-926-19	s	SN74HC158NS:TI
IC15	8-752-332-67	s	CXD1217M:SONY
IC16	8-759-239-58	s	TC74HC221AF:TOSHIBA
IC17	8-759-907-21	s	CX7969:SONY
IC18	8-759-201-61	s	TC40H004F:TOSHIBA
IC19	8-759-201-53	s	TC40H000F:TOSHIBA
IC20	8-759-239-58	s	TC74HC221AF:TOSHIBA
IC21	8-759-239-58	s	TC74HC221AF:TOSHIBA
IC22	8-759-927-46	s	SN74HC00ANS:TI
IC23	8-759-925-74	s	SN74HC04ANS:TI
IC24	8-759-204-72	s	TC40H164F:TOSHIBA
IC25	8-759-939-68	s	TL062ACPS:TI
IC26	8-752-335-47	s	CXD1216M:SONY
IC27	8-759-926-29	s	SN74HC175ANS:TI
IC28	8-759-926-17	s	SN74HC153ANS:TI
IC29	8-759-902-88	s	SN74LS123NS:TI
IC30	8-759-939-68	s	TL062ACPS:TI
IC31	8-759-939-68	s	TL062ACPS:TI
IC32	8-759-939-68	s	TL062ACPS:TI
IC33	8-759-204-63	s	TC40H151F:TOSHIBA
L1	1-408-413-21	s	MICRO 22
L2	1-410-948-11	s	100
L3	1-410-513-11	s	MICRO 22
L4	1-408-413-21	s	MICRO 22
L5	1-408-413-21	s	MICRO 22
L6	1-408-150-11	s	MICRO 22
L7	1-408-413-21	s	MICRO 22
L8	1-408-413-21	s	MICRO 22
L9	1-408-413-21	s	MICRO 22
L10	1-408-413-21	s	MICRO 22
L11	1-408-413-21	s	MICRO 22
L12	1-408-413-21	s	MICRO 22
L13	1-408-413-21	s	MICRO 22
L14	1-408-413-21	s	MICRO 22
L15	1-408-413-21	s	MICRO 22
L16	1-408-413-21	s	MICRO 22
L17	1-410-756-11	s	MICRO 150
L18	1-408-413-21	s	MICRO 22
L19	1-408-413-21	s	MICRO 22
L20	1-408-413-21	s	MICRO 22
L21	1-408-413-21	s	MICRO 22
L22	1-408-413-21	s	MICRO 22
L23	1-408-422-21	s	MICRO 120
L24	1-410-756-11	s	MICRO 150
Q1	8-729-105-29	s	2SA1385
Q2	8-729-101-25	s	2SC1009A
Q3	8-729-101-25	s	2SC1009A
Q4	8-729-101-25	s	2SC1009A
Q5	8-729-101-25	s	2SC1009A
Q6	8-729-101-25	s	2SC1009A
Q7	8-729-101-25	s	2SC1009A
Q8	8-729-122-63	s	2SA1226
Q9	8-729-122-63	s	2SA1226
Q10	8-729-101-25	s	2SC1009A
Q11	8-729-122-63	s	2SA1226
Q12	8-729-101-25	s	2SC1009A
Q13	8-729-101-25	s	2SC1009A
Q14	8-729-101-25	s	2SC1009A
Q15	8-729-113-32	s	2SB733
Q16	8-729-177-44	s	2SD774-5
Q17	8-729-100-75	s	2SA812-M5
Q18	8-729-100-75	s	2SA812-M5
Q19	8-729-100-67	s	2SC1623-L7
Q20	8-729-900-53	s	DTC114EK
Q21	8-729-100-67	s	2SC1623-L7
Q22	8-729-100-75	s	2SA812-M5
Q23	8-729-100-75	s	2SA812-M5
Q24	8-729-100-67	s	2SC1623-L7
Q25	8-729-100-67	s	2SC1623-L7
Q26	8-729-100-67	s	2SC1623-L7
Q27	8-729-100-67	s	2SC1623-L7
Q28	8-729-100-67	s	2SC1623-L7
Q29	8-729-100-67	s	2SC1623-L7

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Ref. No.	Part No.	SP	Description
R1	1-216-699-11	s	METAL 100K 0.50% 1/10W
R2	1-216-682-11	s	METAL 20K 0.50% 1/10W
R4	1-216-682-11	s	METAL 20K 0.50% 1/10W
R5	1-216-679-11	s	METAL 15K 0.50% 1/10W
R8	1-216-685-11	s	METAL 27K 0.50% 1/10W
R9	1-216-673-11	s	METAL 8.2K 0.50% 1/10W
R13	1-216-659-11	s	METAL 2.2K 0.50% 1/10W
R14	1-216-683-11	s	METAL 22K 0.50% 1/10W
R15	1-216-683-11	s	METAL 22K 0.50% 1/10W
R16	1-216-654-11	s	METAL 1.3K 0.50% 1/10W
R17	1-216-659-11	s	METAL 2.2K 0.50% 1/10W
R20	1-216-666-11	s	METAL 4.3K 0.50% 1/10W
R23	1-216-666-11	s	METAL 4.3K 0.50% 1/10W
R32	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R33	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R37	1-216-654-11	s	METAL 1.3K 0.50% 1/10W
R38	1-249-387-11	s	CARBON 3.3 5% 1/4W
R40	1-216-677-11	s	METAL 12K 0.50% 1/10W
R41	1-216-679-11	s	METAL 15K 0.50% 1/10W
R42	1-216-681-11	s	METAL 18K 0.50% 1/10W
R43	1-216-675-11	s	METAL 10K 0.50% 1/10W
R50	1-216-651-11	s	METAL 1K 0.50% 1/10W
R52	1-216-651-11	s	METAL 1K 0.50% 1/10W
R55	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R56	1-216-659-11	s	METAL 2.2K 0.50% 1/10W
R57	1-215-493-00	s	CARBON 1M 5% 1/10W S/N UP TO 20130 (UC) S/N UP TO 30020 (EK) S/N UP TO 10135 (J)
R60	1-216-652-11	s	METAL 1.1K 0.50% 1/10W
R61	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R62	1-216-664-11	s	METAL 3.6K 0.50% 1/10W
R63	1-216-665-11	s	METAL 3.9K 0.50% 1/10W
R64	1-216-679-11	s	METAL 15K 0.50% 1/10W
R65	1-216-651-11	s	METAL 1K 0.50% 1/10W
R67	1-216-651-11	s	METAL 1K 0.50% 1/10W
R68	1-216-671-11	s	METAL 6.8K 5% 1/10W
R83	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R92	1-216-647-11	s	METAL 680 0.50% 1/10W
R95	1-216-662-11	s	METAL 3K 0.50% 1/10W
R96	1-216-653-11	s	METAL 1.2K 0.50% 1/10W
R97	1-216-678-11	s	METAL 13K 0.50% 1/10W
R100	1-249-393-11	s	CARBON 10 5% 1/4W
R101	1-249-402-11	s	CARBON 56 5% 1/4W
R102	1-249-393-11	s	CARBON 10 5% 1/4W
R105	1-216-675-11	s	METAL 10K 0.50% 1/10W
R107	1-216-672-11	s	METAL 7.5K 0.50% 1/10W
R108	1-216-668-11	s	METAL 5.1K 0.50% 1/10W
R109	1-216-683-11	s	METAL 22K 0.50% 1/10W
R110	1-216-675-11	s	METAL 10K 0.50% 1/10W
R116	1-216-675-11	s	METAL 10K 0.50% 1/10W
R117	1-216-659-11	s	METAL 2.2K 0.50% 1/10W
R120	1-216-651-11	s	METAL 1K 0.50% 1/10W
R121	1-216-651-11	s	METAL 1K 0.50% 1/10W
R122	1-216-675-11	s	METAL 10K 0.50% 1/10W
R123	1-216-651-11	s	METAL 1K 0.50% 1/10W
R128	1-216-627-11	s	METAL 100 0.50% 1/10W
R129	1-216-659-11	s	METAL 2.2K 0.50% 1/10W
R130	1-216-675-11	s	METAL 10K 0.50% 1/10W
R131	1-216-651-11	s	METAL 1K 0.50% 1/10W
R132	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R133	1-216-675-11	s	METAL 10K 0.50% 1/10W
R135	1-216-659-11	s	METAL 2.2K 0.50% 1/10W
R136	1-216-684-11	s	METAL 24K 0.50% 1/10W
R137	1-216-682-11	s	METAL 20K 0.50% 1/10W
R142	1-216-683-11	s	METAL 22K 0.50% 1/10W
R143	1-216-683-11	s	METAL 22K 0.50% 1/10W
R144	1-216-680-11	s	METAL 16K 0.50% 1/10W
R149	1-216-651-11	s	METAL 1K 0.50% 1/10W
R151	1-216-651-11	s	METAL 1K 0.50% 1/10W
R153	1-249-403-11	s	CARBON 68 5% 1/4W
R197	1-216-699-11	s	METAL 100K 0.50% 1/10W
R198	1-216-661-11	s	METAL 2.7K 0.50% 1/10W
R199	1-216-651-11	s	METAL 1K 0.50% 1/10W
R200	1-216-675-11	s	METAL 10K 0.50% 1/10W
R202	1-216-675-11	s	METAL 10K 0.50% 1/10W
R207	1-216-645-11	s	METAL 560 0.50% 1/10W
R208	1-249-429-11	s	CARBON 10K 0.50% 1/4W S/N UP TO 20130 (UC) S/N UP TO 30020 (EK) S/N UP TO 10135 (J)
R210	1-249-419-11	s	CARBON 1.5K 0.50% 1/4W
RV1	1-228-457-00	s	CERMET 2K
RV2	1-228-471-00	s	CERMET 1K
RV3	1-228-461-00	s	CERMET 50K
RV5	1-228-457-00	s	CERMET 2K
RV6	1-228-458-00	s	CERMET 5K
RV7	1-228-459-00	s	CERMET 10K
RV8	1-228-459-11	s	CERMET 10K
RV9	1-228-459-11	s	CERMET 10K
RV10	1-228-460-11	s	CERMET 20K
RV11	1-228-459-11	s	CERMET 10K
RV12	1-228-472-11	s	CERMET 2K
RV13	1-228-459-11	s	CERMET 10K
RV14	1-228-460-11	s	CERMET 20K
S1	1-553-252-11	s	ROTARY
S2	1-570-611-11	s	TOGGLE
THP1	1-806-166-11	s	4300 ±5%

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Ref. No.	Part No.	SP	Description
	VA-63 BOARD		
	A-7513-601-A	o	MOUNTED CIRCUIT BOARD "VA-63"
C4	1-131-367-00	s	TANTALUM 22 10% 16V
C6	1-131-367-00	s	TANTALUM 22 10% 16V
C9	1-131-367-00	s	TANTALUM 22 10% 16V
C10	1-131-365-00	s	TANTALUM 10 10% 16V
C11	1-131-365-00	s	TANTALUM 10 10% 16V
C18	1-131-365-00	s	TANTALUM 10 10% 16V
C19	1-131-365-00	s	TANTALUM 10 10% 16V
C20	1-163-102-00	s	CERAMIC 24PF 5% 50V
C21	1-163-102-00	s	CERAMIC 24PF 5% 50V
C22	1-131-365-00	s	TANTALUM 10 10% 16V
C23	1-131-365-00	s	TANTALUM 10 10% 16V
C24	1-131-367-00	s	TANTALUM 22 10% 16V
C25	1-131-367-00	s	TANTALUM 22 10% 16V
C26	1-131-365-00	s	TANTALUM 10 10% 16V
C27	1-131-365-00	s	TANTALUM 10 10% 16V
C29	1-131-365-00	s	TANTALUM 10 10% 16V
C30	1-131-365-00	s	TANTALUM 10 10% 16V
C32	1-131-365-00	s	TANTALUM 10 10% 16V
C33	1-131-365-00	s	TANTALUM 10 10% 16V
C34	1-131-365-00	s	TANTALUM 10 10% 16V
C35	1-163-083-00	s	CERAMIC 1PF 0.25PF 50V
C36	1-163-083-00	s	CERAMIC 1PF 0.25PF 50V
C41	1-163-086-00	s	CERAMIC 3PF 0.25PF 50V
C42	1-163-086-00	s	CERAMIC 3PF 0.25PF 50V
C101	1-131-367-00	s	TANTALUM 22 10% 16V
C102	1-161-886-11	s	CERAMIC 4700PF 50V
C103	1-162-765-11	s	CERAMIC 0.001 5% 50V
C104	1-131-367-00	s	TANTALUM 22 10% 16V
C106	1-163-086-00	s	CERAMIC 3PF 0.25PF 50V
C108	1-131-374-00	s	TANTALUM 33 10% 10V
C109	1-131-374-00	s	TANTALUM 33 10% 10V
C110	1-162-742-21	s	CERAMIC 27PF 5% 50V
C111	1-162-747-21	s	CERAMIC 56PF 5% 50V
C112	1-162-742-21	s	CERAMIC 27PF 5% 50V
C114	1-131-374-00	s	TANTALUM 33 10% 10V
C115	1-131-374-00	s	TANTALUM 33 10% 10V
C116	1-162-750-21	s	CERAMIC 75PF 5% 50V
C117	1-162-749-11	s	CERAMIC 68PF 5% 50V
C118	1-162-748-21	s	CERAMIC 62PF 5% 50V
C120	1-102-935-00	s	CERAMIC 2PF 0.5PF 50V
C124	1-131-374-00	s	TANTALUM 33 10% 10V
C125	1-131-374-00	s	TANTALUM 33 10% 10V
C126	1-162-674-11	s	CERAMIC 39PF 5% 50V
C127	1-102-943-00	s	CERAMIC 6PF 0.5PF 50V
C128	1-162-670-11	s	CERAMIC 18PF 5% 50V
C130	1-131-374-00	s	TANTALUM 33 10% 10V
C131	1-131-374-00	s	TANTALUM 33 10% 10V
C132	1-162-751-11	s	CERAMIC 82PF 5% 50V
C133	1-162-671-11	s	CERAMIC 22PF 5% 50V
C134	1-162-674-11	s	CERAMIC 39PF 5% 50V
C136	1-102-935-00	s	CERAMIC 2PF 0.5PF 50V
C138	1-131-365-00	s	TANTALUM 10 10% 16V
C139	1-131-365-00	s	TANTALUM 10 10% 16V
C140	1-131-374-00	s	TANTALUM 33 10% 10V
C141	1-131-374-00	s	TANTALUM 33 10% 10V
C142	1-162-879-11	s	CERAMIC 47PF 5% 50V
C143	1-162-673-11	s	CERAMIC 33PF 5% 50V
C144	1-162-737-11	s	CERAMIC 10PF 5% 50V
C146	1-131-374-00	s	TANTALUM 33 10% 10V
C147	1-131-374-00	s	TANTALUM 33 10% 10V
C148	1-162-880-11	s	CERAMIC 120PF 5% 50V
C149	1-162-748-21	s	CERAMIC 62PF 5% 50V
C150	1-162-673-11	s	CERAMIC 33PF 5% 50V
C153	1-163-225-11	s	CERAMIC 8PF 5% 50V
C156	1-161-897-21	s	CERAMIC 0.33 50V
C158	1-131-365-00	s	TANTALUM 10 10% 16V
C301	1-131-367-00	s	TANTALUM 22 10% 16V
C302	1-161-886-11	s	CERAMIC 4700PF 50V
C303	1-162-765-21	s	CERAMIC 0.001 5% 50V
C304	1-131-367-00	s	TANTALUM 22 10% 16V
C306	1-163-086-00	s	CERAMIC 3PF 0.25PF 50V
C308	1-131-374-00	s	TANTALUM 33 10% 10V
C309	1-131-374-00	s	TANTALUM 33 10% 10V
C310	1-162-742-21	s	CERAMIC 27PF 5% 50V
C311	1-162-747-11	s	CERAMIC 56PF 5% 50V
C312	1-162-742-21	s	CERAMIC 27PF 5% 50V
C314	1-131-374-00	s	TANTALUM 33 10% 10V
C315	1-131-374-00	s	TANTALUM 33 10% 10V
C316	1-162-750-21	s	CERAMIC 75PF 5% 50V
C317	1-162-749-11	s	CERAMIC 68PF 5% 50V
C318	1-162-748-21	s	CERAMIC 62PF 5% 50V
C320	1-102-935-00	s	CERAMIC 2PF 0.5PF 50V
C324	1-131-374-00	s	TANTALUM 33 10% 10V
C325	1-131-374-00	s	TANTALUM 33 10% 10V
C326	1-162-674-11	s	CERAMIC 39PF 5% 50V
C327	1-102-943-00	s	CERAMIC 6PF 0.5PF 50V
C328	1-162-670-11	s	CERAMIC 18PF 5% 50V
C330	1-131-374-00	s	TANTALUM 33 10% 10V
C331	1-131-374-00	s	TANTALUM 33 10% 10V
C332	1-162-751-11	s	CERAMIC 82PF 5% 50V
C333	1-162-671-11	s	CERAMIC 22PF 5% 50V
C334	1-162-674-11	s	CERAMIC 39PF 5% 50V
C336	1-102-935-00	s	CERAMIC 2PF 0.5PF 50V
C338	1-131-365-00	s	TANTALUM 10 10% 16V
C339	1-131-365-00	s	TANTALUM 10 10% 16V
C340	1-131-374-00	s	TANTALUM 33 10% 10V
C341	1-131-374-00	s	TANTALUM 33 10% 10V
C342	1-162-871-11	s	CERAMIC 47PF 5% 50V
C343	1-162-673-11	s	CERAMIC 33PF 5% 50V
C344	1-162-737-21	s	CERAMIC 10PF 5% 50V
C346	1-131-374-00	s	TANTALUM 33 10% 10V
C347	1-131-374-00	s	TANTALUM 33 10% 10V
C348	1-162-880-11	s	CERAMIC 120PF 5% 50V

Parts that are not listed in the "reference number order list" are shown in the "General Purpose Electrical Parts List".

Ref.No.	Part No.	SP	Description
C349	1-162-748-21	s	CERAMIC 62PF 5% 50V
C350	1-162-673-11	s	CERAMIC 33PF 5% 50V
C353	1-163-086-00	s	CERAMIC 3PF 0.25PF 50V
C356	1-161-900-11	s	CERAMIC 1 50V
C358	1-131-365-00	s	TANTALUM 10 10% 16V
C501	1-131-367-00	s	TANTALUM 22 10% 16V
C502	1-161-886-11	s	CERAMIC 4700PF 50V
C503	1-162-765-11	s	CERAMIC 0.001 5% 50V
C504	1-131-367-00	s	TANTALUM 22 10% 16V
C506	1-163-086-00	s	CERAMIC 3PF 0.25PF 50V
C508	1-131-374-00	s	TANTALUM 33 10% 10V
C509	1-131-374-00	s	TANTALUM 33 10% 10V
C510	1-162-742-21	s	CERAMIC 27PF 5% 50V
C511	1-162-747-11	s	CERAMIC 56PF 5% 50V
C512	1-162-742-21	s	CERAMIC 27PF 5% 50V
C514	1-131-374-00	s	TANTALUM 33 10% 10V
C515	1-131-374-00	s	TANTALUM 33 10% 10V
C516	1-162-750-21	s	CERAMIC 75PF 5% 50V
C517	1-162-749-11	s	CERAMIC 68PF 5% 50V
C518	1-162-748-21	s	CERAMIC 62PF 5% 50V
C520	1-102-935-00	s	CERAMIC 2PF 0.5PF 50V
C524	1-131-374-00	s	TANTALUM 33 10% 10V
C525	1-131-374-00	s	TANTALUM 33 10% 10V
C526	1-162-674-11	s	CERAMIC 39PF 5% 50V
C527	1-102-943-00	s	CERAMIC 6PF 0.5PF 50V
C528	1-162-670-11	s	CERAMIC 18PF 5% 50V
C530	1-131-374-00	s	TANTALUM 33 10% 10V
C531	1-131-374-00	s	TANTALUM 33 10% 10V
C532	1-162-751-11	s	CERAMIC 82PF 5% 50V
C533	1-162-671-11	s	CERAMIC 22PF 5% 50V
C534	1-162-674-11	s	CERAMIC 39PF 5% 50V
C536	1-102-935-00	s	CERAMIC 2PF 0.5PF 50V
C538	1-131-365-00	s	TANTALUM 10 10% 16V
C539	1-131-365-00	s	TANTALUM 10 10% 16V
C540	1-131-374-00	s	TANTALUM 33 10% 10V
C541	1-131-374-00	s	TANTALUM 33 10% 10V
C542	1-162-871-11	s	CERAMIC 47PF 5% 50V
C543	1-162-673-11	s	CERAMIC 33PF 5% 50V
C544	1-162-737-21	s	CERAMIC 10PF 5% 50V
C546	1-131-374-00	s	TANTALUM 33 10% 10V
C547	1-131-374-00	s	TANTALUM 33 10% 10V
C548	1-162-880-11	s	CERAMIC 120PF 5% 50V
C549	1-162-748-21	s	CERAMIC 62PF 5% 50V
C550	1-162-673-11	s	CERAMIC 33PF 5% 50V
C553	1-163-093-00	s	CERAMIC 10PF 5% 50V
C556	1-161-900-11	s	CERAMIC 1 50V
C558	1-131-365-00	s	TANTALUM 10 10% 16V
CN1	1-560-747-11	o	RECEPTACLE, 53P, MALE

Ref.No.	Part No.	SP	Description
D1	8-719-100-41	s	RD6.8EB2
D2	8-719-102-51	s	1SZ51
D3	8-719-100-41	s	RD6.8EB2
D4	8-719-101-23	s	1SS123
D5	8-719-100-03	s	1S2835
D6	8-719-100-03	s	1S2835
D7	8-719-100-03	s	1S2835
D8	8-719-100-03	s	1S2835
D9	8-719-100-05	s	1S2837
D10	8-719-100-05	s	1S2837
D11	8-719-100-03	s	1S2835
D12	8-719-100-19	s	RD3.6EB2
D13	8-719-100-03	s	1S2835
D14	8-719-100-19	s	RD3.6EB2
D15	8-719-100-03	s	1S2835
D16	8-719-100-03	s	1S2835
D101	8-719-100-19	s	RD3.6EB2
D102	8-719-100-03	s	1S2835
D103	8-719-100-03	s	1S2835
D104	8-719-100-03	s	1S2835
D105	8-719-100-03	s	1S2835
D301	8-719-100-19	s	RD3.6EB2
D302	8-719-100-03	s	1S2835
D303	8-719-100-03	s	1S2835
D304	8-719-100-03	s	1S2835
D305	8-719-100-03	s	1S2835
D501	8-719-100-19	s	RD3.6EB2
D502	8-719-100-03	s	1S2835
D503	8-719-100-03	s	1S2835
D504	8-719-100-03	s	1S2835
D505	8-719-100-03	s	1S2835
IC1	8-759-908-92	s	TL084CNS:TI
IC2	8-759-239-68	s	TC74HC4028AF:TOSHIBA
IC3	8-759-925-85	s	SN74HC32ANS:TI
IC4	8-759-201-61	s	TC40H004F:TOSHIBA
IC5	8-759-906-54	s	TL064CNS:TI
JR101	1-216-296-91	s	METAL 0 5% 1/8W
JR102	1-216-296-91	s	METAL 0 5% 1/8W
JR103	1-216-296-91	s	METAL 0 5% 1/8W
JR104	1-216-296-91	s	METAL 0 5% 1/8W
JR301	1-216-296-91	s	METAL 0 5% 1/8W
JR302	1-216-296-91	s	METAL 0 5% 1/8W
JR303	1-216-296-91	s	METAL 0 5% 1/8W
JR304	1-216-296-91	s	METAL 0 5% 1/8W
JR501	1-216-296-91	s	METAL 0 5% 1/8W
JR502	1-216-296-91	s	METAL 0 5% 1/8W
JR503	1-216-296-91	s	METAL 0 5% 1/8W
JR504	1-216-296-91	s	METAL 0 5% 1/8W

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Ref. No.	Part No.	SP	Description
L1	1-408-427-00	s	MICRO 330
L2	1-408-413-21	s	MICRO 22
L3	1-408-413-21	s	MICRO 22
L4	1-408-413-21	s	MICRO 22
L5	1-408-413-21	s	MICRO 22
L101	1-408-413-21	s	MICRO 22
L102	1-408-413-21	s	MICRO 22
L301	1-408-413-21	s	MICRO 22
L302	1-408-413-21	s	MICRO 22
L501	1-408-413-21	s	MICRO 22
L502	1-408-413-21	s	MICRO 22
Q1	8-729-113-32	s	2SB733
Q2	8-729-177-43	s	2SD774
Q3	8-729-100-75	s	2SA812-M5
Q4	8-729-100-67	s	2SC1623-L7
Q5	8-729-100-67	s	2SC1623-L7
Q6	8-729-100-67	s	2SC1623-L7
Q7	8-729-100-67	s	2SC1623-L7
Q8	8-729-100-67	s	2SC1623-L7
Q9	8-729-100-67	s	2SC1623-L7
Q10	8-729-312-22	s	2SA1122
Q11	8-729-200-87	s	2SC2714Y
Q12	8-729-100-67	s	2SC1623-L7
Q13	8-729-312-22	s	2SA1122
Q14	8-729-200-87	s	2SC2714Y
Q15	8-729-100-67	s	2SC1623-L7
Q16	8-729-100-75	s	2SA812-M5
Q17	8-729-100-75	s	2SA812-M5
Q18	8-729-200-87	s	2SC2714Y
Q19	8-729-312-22	s	2SA1122
Q20	8-729-312-22	s	2SA1122
Q21	8-729-200-87	s	2SC2714Y
Q22	8-729-122-63	s	2SA1226
Q23	8-729-200-87	s	2SC2714Y
Q24	8-729-122-63	s	2SA1226
Q101	8-729-200-87	s	2SC2714Y
Q102	8-729-122-63	s	2SA1226
Q103	8-729-122-63	s	2SA1226
Q104	8-729-200-87	s	2SC2714Y
Q105	8-729-200-87	s	2SC2714Y
Q106	8-729-200-87	s	2SC2714Y
Q107	8-729-200-87	s	2SC2714Y
Q108	8-729-200-87	s	2SC2714Y
Q109	8-729-312-22	s	2SA1122
Q110	8-729-312-22	s	2SA1122
Q111	8-729-200-87	s	2SC2714Y
Q112	8-729-200-87	s	2SC2714Y
Q113	8-729-200-87	s	2SC2714Y
Q114	8-729-200-87	s	2SC2714Y
Q115	8-729-312-22	s	2SA1122
Q116	8-729-312-22	s	2SA1122
Q117	8-729-200-87	s	2SC2714Y
Q118	8-729-200-87	s	2SC2714Y
Q119	8-729-200-87	s	2SC2714Y
Q120	8-729-312-22	s	2SA1122
Q121	8-729-312-22	s	2SA1122
Q122	8-729-200-87	s	2SC2714Y
Q123	8-729-200-87	s	2SC2714Y
Q124	8-729-312-22	s	2SA1122
Q125	8-729-200-87	s	2SC2714Y
Q126	8-729-200-87	s	2SC2714Y
Q127	8-729-200-87	s	2SC2714Y
Q128	8-729-101-25	s	2SC1009A
Q129	8-729-312-22	s	2SA1122
Q130	8-729-312-22	s	2SA1122
Q131	8-729-200-87	s	2SC2714Y
Q132	8-729-100-75	s	2SA812-M5
Q133	8-729-100-75	s	2SA812-M5
Q134	8-729-200-87	s	2SC2714Y
Q135	8-729-100-75	s	2SA812-M5
Q136	8-729-312-22	s	2SA1122
Q301	8-729-200-87	s	2SC2714Y
Q302	8-729-122-63	s	2SA1226
Q303	8-729-122-63	s	2SA1226
Q304	8-729-200-87	s	2SC2714Y
Q305	8-729-200-87	s	2SC2714Y
Q306	8-729-200-87	s	2SC2714Y
Q307	8-729-200-87	s	2SC2714Y
Q308	8-729-200-87	s	2SC2714Y
Q309	8-729-312-22	s	2SA1122
Q310	8-729-312-22	s	2SA1122
Q311	8-729-200-87	s	2SC2714Y
Q312	8-729-200-87	s	2SC2714Y
Q313	8-729-200-87	s	2SC2714Y
Q314	8-729-200-87	s	2SC2714Y
Q315	8-729-312-22	s	2SA1122
Q316	8-729-312-22	s	2SA1122
Q317	8-729-200-87	s	2SC2714Y
Q318	8-729-200-87	s	2SC2714Y
Q319	8-729-200-87	s	2SC2714Y
Q320	8-729-312-22	s	2SA1122
Q321	8-729-312-22	s	2SA1122
Q322	8-729-200-87	s	2SC2714Y
Q323	8-729-200-87	s	2SC2714Y
Q324	8-729-312-22	s	2SA1122
Q325	8-729-200-87	s	2SC2714Y
Q326	8-729-200-87	s	2SC2714Y
Q327	8-729-200-87	s	2SC2714Y
Q328	8-729-101-25	s	2SC1009A
Q329	8-729-312-22	s	2SA1122
Q330	8-729-312-22	s	2SA1122

Parts that are not listed in the "reference number order list" are shown in the "General Purpose Electrical Parts List".

Ref. No.	Part No.	SP	Description
Q331	8-729-200-87	s	2SC2714Y
Q332	8-729-100-75	s	2SA812-M5
			S/N 10501 AND HIGHER (FOR J)
			S/N 20501 AND HIGHER (FOR UC)
			S/N 30301 AND HIGHER (FOR EK)
Q333	8-729-100-75	s	2SA812-M5
			S/N 10501 AND HIGHER (FOR J)
			S/N 20501 AND HIGHER (FOR UC)
			S/N 30301 AND HIGHER (FOR EK)
Q334	8-729-200-87	s	2SC2714Y
Q335	8-729-100-75	s	2SA812-M5
Q336	8-729-312-22	s	2SA1122
Q501	8-729-200-87	s	2SC2714Y
Q502	8-729-122-63	s	2SA1226
Q503	8-729-122-63	s	2SA1226
Q504	8-729-200-87	s	2SC2714Y
Q505	8-729-200-87	s	2SC2714Y
Q506	8-729-200-87	s	2SC2714Y
Q507	8-729-200-87	s	2SC2714Y
Q508	8-729-200-87	s	2SC2714Y
Q509	8-729-312-22	s	2SA1122
Q510	8-729-312-22	s	2SA1122
Q511	8-729-200-87	s	2SC2714Y
Q512	8-729-200-87	s	2SC2714Y
Q513	8-729-200-87	s	2SC2714Y
Q514	8-729-200-87	s	2SC2714Y
Q515	8-729-312-22	s	2SA1122
Q516	8-729-312-22	s	2SA1122
Q517	8-729-200-87	s	2SC2714Y
Q518	8-729-200-87	s	2SC2714Y
Q519	8-729-200-87	s	2SC2714Y
Q520	8-729-312-22	s	2SA1122
Q521	8-729-312-22	s	2SA1122
Q522	8-729-200-87	s	2SC2714Y
Q523	8-729-200-87	s	2SC2714Y
Q524	8-729-312-22	s	2SA1122
Q525	8-729-200-87	s	2SC2714Y
Q526	8-729-200-87	s	2SC2714Y
Q527	8-729-200-87	s	2SC2714Y
Q528	8-729-101-25	s	2SC1009A
Q529	8-729-312-22	s	2SA1122
Q530	8-729-312-22	s	2SA1122
Q531	8-729-200-87	s	2SC2714Y
Q532	8-729-100-75	s	2SA812-M5
			S/N 10501 AND HIGHER (FOR J)
			S/N 20501 AND HIGHER (FOR UC)
			S/N 30301 AND HIGHER (FOR EK)
Q533	8-729-100-75	s	2SA812-M5
			S/N 10501 AND HIGHER (FOR J)
			S/N 20501 AND HIGHER (FOR UC)
			S/N 30301 AND HIGHER (FOR EK)
Q534	8-729-200-87	s	2SC2714Y
Q535	8-729-100-75	s	2SA812-M5
Q536	8-729-312-22	s	2SA1122

Ref. No.	Part No.	SP	Description
R4	1-216-673-11	s	METAL 8.2K 0.50% 1/10W
R5	1-216-682-11	s	METAL 20K 0.50% 1/10W
R6	1-216-685-11	s	METAL 27K 0.50% 1/10W
R7	1-216-679-11	s	METAL 15K 0.50% 1/10W
R8	1-216-677-11	s	METAL 12K 0.50% 1/10W
R9	1-216-679-11	s	METAL 15K 0.50% 1/10W
R39	1-216-664-11	s	METAL 3.6K 0.50% 1/10W
R42	1-216-658-11	s	METAL 2K 0.50% 1/10W
R43	1-216-658-11	s	METAL 2K 0.50% 1/10W
R45	1-249-417-11	s	CARBON 1K 5% 1/4W
R47	1-216-676-11	s	METAL 11K 0.50% 1/10W
R49	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R51	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R52	1-249-417-11	s	CARBON 1K 5% 1/4W
R54	1-216-676-11	s	METAL 11K 0.50% 1/10W
R56	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R59	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R65	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R67	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R68	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R69	1-216-671-11	s	METAL 6.8K 0.50% 1/10W
R71	1-216-675-11	s	METAL 10K 0.50% 1/10W
R72	1-216-683-11	s	METAL 22K 0.50% 1/10W
R77	1-216-624-11	s	METAL 75 0.50% 1/10W
R101	1-216-624-11	s	METAL 75 0.50% 1/10W
R102	1-249-397-11	s	CARBON 22 5% 1/4W
R104	1-216-659-11	s	METAL 2.2K 0.50% 1/10W
R105	1-216-651-11	s	METAL 1K 0.50% 1/10W
R106	1-216-651-11	s	METAL 1K 0.50% 1/10W
R107	1-216-651-11	s	METAL 1K 0.50% 1/10W
R109	1-216-659-11	s	METAL 2.2K 0.50% 1/10W
R110	1-214-559-11	s	METAL 1.2K 1% 1/8W
R111	1-216-675-11	s	METAL 10K 0.50% 1/10W
R112	1-214-573-11	s	METAL 4.7K 1% 1/8W
R113	1-216-681-11	s	METAL 18K 0.50% 1/10W
R115	1-216-635-11	s	METAL 220 0.50% 1/10W
R116	1-214-562-11	s	METAL 1.6K 1% 1/8W
R117	1-214-581-11	s	METAL 10K 1% 1/8W
R118	1-214-556-11	s	METAL 910 1% 1/8W
R121	1-214-557-11	s	METAL 1K 1% 1/8W
R122	1-214-561-11	s	METAL 1.5K 1% 1/8W
R123	1-214-550-11	s	METAL 510 1% 0/8W
R129	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R130	1-214-561-11	s	METAL 1.5K 1% 1/8W
R131	1-216-675-11	s	METAL 10K 0.50% 1/10W
R132	1-216-659-11	s	METAL 2.2K 0.50% 1/10W
R133	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R134	1-214-575-11	s	METAL 5.6K 1% 1/8W
R135	1-216-680-11	s	METAL 16K 0.50% 1/10W
R137	1-216-667-11	s	METAL 4.7K 0.50% 1/10W

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Ref.No.	Part No.	SP	Description
R138	1-216-641-11	s	METAL 390 0.50% 1/10W
R139	1-214-571-11	s	METAL 3.9K 1% 1/8W
R140	1-214-567-11	s	METAL 2.7K 1% 1/8W
R141	1-214-569-11	s	METAL 3.3K 1% 1/8W
R144	1-214-565-11	s	METAL 2.2K 1% 1/8W
R145	1-214-563-11	s	METAL 1.8K 1% 1/8W
R146	1-214-563-11	s	METAL 1.8K 1% 1/8W
R152	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R153	1-214-561-11	s	METAL 1.5K 1% 1/8W
R154	1-216-675-11	s	METAL 10K 0.50% 1/10W
R155	1-216-658-11	s	METAL 2K 0.50% 1/10W
R156	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R157	1-214-575-11	s	METAL 5.6K 1% 1/8W
R158	1-216-680-11	s	METAL 16K 0.50% 1/10W
R160	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R161	1-216-641-11	s	METAL 390 0.50% 1/10W
R162	1-214-573-11	s	METAL 4.7K 1% 1/8W
R163	1-214-581-11	s	METAL 10K 1% 1/8W
R164	1-214-560-11	s	METAL 1.3K 1% 1/8W
R167	1-214-566-11	s	METAL 2.4K 1% 1/8W
R168	1-214-577-11	s	METAL 6.8K 1% 1/8W
R169	1-214-554-11	s	METAL 750 1% 1/8W
R178	1-216-658-11	s	METAL 2K 0.50% 1/10W
R179	1-216-650-11	s	METAL 910 0.50% 1/10W
R180	1-216-650-11	s	METAL 910 0.50% 1/10W
R181	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R182	1-216-669-11	s	METAL 5.6K 0.50% 1/10W
R183	1-216-651-11	s	METAL 1K 0.50% 1/10W
R184	1-216-675-11	s	METAL 10K 0.50% 1/10W
R185	1-216-674-11	s	METAL 9.1K 0.50% 1/10W
R186	1-216-677-11	s	METAL 12K 0.50% 1/10W
R187	1-216-671-11	s	METAL 6.8K 0.50% 1/10W
R190	1-216-683-11	s	METAL 22K 0.50% 1/10W
R191	1-216-677-11	s	METAL 12K 0.50% 1/10W
R196	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R197	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R198	1-216-683-11	s	METAL 22K 0.50% 1/10W
R200	1-216-641-11	s	METAL 390 0.50% 1/10W
R201	1-216-659-11	s	METAL 2.2K 0.50% 1/10W
R202	1-216-653-11	s	METAL 1.2K 0.50% 1/10W
R203	1-216-641-11	s	METAL 390 0.50% 1/10W
R207	1-216-643-11	s	METAL 470 0.50% 1/10W
R211	1-216-603-11	s	METAL 10 0.50% 1/10W
R212	1-216-683-11	s	METAL 22K 0.50% 1/10W
R214	1-249-417-11	s	CARBON 1K 5% 1/4W S/N UP TO 10135 (J) S/N UP TO 20130 (UC) S/N UP TO 30020 (EK)
R215	1-247-881-00	s	CARBON 120K 5% 1/4W S/N UP TO 10135 (J) S/N UP TO 20130 (UC) S/N UP TO 30020 (EK)
R216	1-247-881-00	s	CARBON 120K 5% 1/4W S/N UP TO 10135 (J) S/N UP TO 20130 (UC) S/N UP TO 30020 (EK)

Ref.No.	Part No.	SP	Description
R301	1-216-624-11	s	METAL 75 0.50% 1/10W
R302	1-249-397-11	s	CARBON 22 5% 1/4W
R304	1-216-659-11	s	METAL 2.2K 0.50% 1/10W
R305	1-216-651-11	s	METAL 1K 0.50% 1/10W
R306	1-216-651-11	s	METAL 1K 0.50% 1/10W
R307	1-216-651-11	s	METAL 1K 0.50% 1/10W
R309	1-216-659-11	s	METAL 2.2K 0.50% 1/10W
R310	1-214-559-11	s	METAL 1.2K 1% 1/8W
R311	1-216-675-11	s	METAL 10K 0.50% 1/10W
R312	1-214-573-11	s	METAL 4.7K 1% 1/8W
R313	1-216-681-11	s	METAL 18K 0.50% 1/10W
R315	1-216-635-11	s	METAL 220 0.50% 1/10W
R316	1-214-562-11	s	METAL 1.6K 1% 1/8W
R317	1-214-581-11	s	METAL 10K 1% 1/8W
R318	1-214-556-11	s	METAL 910 1% 1/8W
R321	1-214-557-11	s	METAL 1K 1% 1/8W
R322	1-214-561-11	s	METAL 1.5K 1% 1/8W
R323	1-214-550-11	s	METAL 510 1% 1/8W
R329	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R330	1-214-561-11	s	METAL 1.5K 1% 1/8W
R331	1-216-675-11	s	METAL 10K 0.50% 1/10W
R332	1-216-659-11	s	METAL 2.2K 0.50% 1/10W
R333	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R334	1-214-575-11	s	METAL 5.6K 1% 1/8W
R335	1-216-680-11	s	METAL 16K 0.50% 1/10W
R337	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R338	1-216-641-11	s	METAL 390 0.50% 1/10W
R339	1-214-571-11	s	METAL 3.9K 1% 1/8W
R340	1-214-567-11	s	METAL 2.7K 1% 1/8W
R341	1-214-569-11	s	METAL 3.3K 1% 1/8W
R344	1-214-565-11	s	METAL 2.2K 1% 1/8W
R345	1-214-563-11	s	METAL 1.8K 1% 1/8W
R346	1-214-563-11	s	METAL 1.8K 1% 1/8W
R352	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R353	1-214-561-11	s	METAL 1.5K 1% 1/8W
R354	1-216-675-11	s	METAL 10K 0.50% 1/10W
R355	1-216-658-11	s	METAL 2K 0.50% 1/10W
R356	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R357	1-214-575-11	s	METAL 5.6K 1% 1/8W
R358	1-216-680-11	s	METAL 16K 0.50% 1/10W
R360	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R361	1-216-641-11	s	METAL 390 0.50% 1/10W
R362	1-214-573-11	s	METAL 4.7K 1% 1/8W
R363	1-214-581-11	s	METAL 10K 1% 1/8W
R364	1-214-560-11	s	METAL 1.3K 1% 1/8W
R367	1-214-566-11	s	METAL 2.4K 1% 1/8W
R368	1-214-577-11	s	METAL 6.8K 1% 1/8W
R369	1-214-554-11	s	METAL 750 1% 1/8W
R378	1-216-658-11	s	METAL 2K 0.50% 1/10W
R379	1-216-650-11	s	METAL 910 0.50% 1/10W
R380	1-216-650-11	s	METAL 910 0.50% 1/10W
R382	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R383	1-216-669-11	s	METAL 5.6K 0.50% 1/10W
R384	1-216-651-11	s	METAL 1K 0.50% 1/10W
R385	1-216-675-11	s	METAL 10K 0.50% 1/10W

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Ref.No.	Part No.	SP	Description
R386	1-216-674-11	s	METAL 9.1K 0.50% 1/10W
R387	1-216-659-11	s	METAL 2.2K 0.50% 1/10W
R388	1-216-671-11	s	METAL 6.8K 0.50% 1/10W
R391	1-216-683-11	s	METAL 22K 0.50% 1/10W
R392	1-216-677-11	s	METAL 12K 0.50% 1/10W
R397	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R398	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R399	1-216-683-11	s	METAL 22K 0.50% 1/10W
R401	1-216-641-11	s	METAL 390 0.50% 1/10W
R402	1-216-659-11	s	METAL 2.2K 0.50% 1/10W
R408	1-216-643-11	s	METAL 470 0.50% 1/10W
R412	1-216-603-11	s	METAL 10 0.50% 1/10W
R413	1-216-683-11	s	METAL 22K 0.50% 1/10W
R415	1-247-881-00	s	CARBON 120K 5% 1/4W S/N UP TO 20130 (FOR UC) S/N UP TO 30020 (FOR EK) S/N UP TO 10135 (FOR J)
R416	1-247-881-00	s	CARBON 120K 5% 1/4W S/N UP TO 20130 (FOR UC) S/N UP TO 30020 (FOR EK) S/N UP TO 10135 (FOR J)
R501	1-216-624-11	s	METAL 75 0.50% 1/10W
R502	1-249-397-11	s	CARBON 22 5% 1/4W
R504	1-216-659-11	s	METAL 2.2K 0.50% 1/10W
R505	1-216-651-11	s	METAL 1K 0.50% 1/10W
R506	1-216-651-11	s	METAL 1K 0.50% 1/10W
R507	1-216-651-11	s	METAL 1K 0.50% 1/10W
R509	1-216-659-11	s	METAL 2.2K 0.50% 1/10W
R510	1-214-559-11	s	METAL 1.2K 1% 1/8W
R511	1-216-675-11	s	METAL 10K 0.50% 1/10W
R512	1-214-573-11	s	METAL 4.7K 1% 1/8W
R513	1-216-681-11	s	METAL 18K 0.50% 1/10W
R515	1-216-635-11	s	METAL 220 0.50% 1/10W
R516	1-214-562-11	s	METAL 1.6K 1% 1/8W
R517	1-214-581-11	s	METAL 10K 1% 1/8W
R518	1-214-556-11	s	METAL 910 1% 1/8W
R521	1-214-557-11	s	METAL 1K 1% 1/8W
R522	1-214-561-11	s	METAL 1.5K 1% 1/8W
R523	1-214-550-11	s	METAL 510 1% 1/8W
R529	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R530	1-214-561-11	s	METAL 1.5K 1% 1/8W
R531	1-216-675-11	s	METAL 10K 0.50% 1/10W
R532	1-216-659-11	s	METAL 2.2K 0.50% 1/10W
R533	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R534	1-214-575-11	s	METAL 5.6K 1% 1/8W
R535	1-216-680-11	s	METAL 16K 0.50% 1/10W
R537	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R538	1-216-641-11	s	METAL 390 0.50% 1/10W
R539	1-214-571-11	s	METAL 3.9K 1% 1/8W
R540	1-214-567-11	s	METAL 2.7K 1% 1/8W
R541	1-214-569-11	s	METAL 3.3K 1% 1/8W
R544	1-214-565-11	s	METAL 2.2K 1% 1/8W
R545	1-214-563-11	s	METAL 1.8K 1% 1/8W
R546	1-214-563-11	s	METAL 1.8K 1% 1/8W
R552	1-216-663-11	s	METAL 3.3K 0.50% 1/10W
R553	1-214-561-11	s	METAL 1.5K 1% 1/8W

Ref.No.	Part No.	SP	Description
R554	1-216-675-11	s	METAL 10K 0.50% 1/10W
R555	1-216-658-11	s	METAL 2K 0.50% 1/10W
R556	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R557	1-214-575-11	s	METAL 5.6K 1% 1/8W
R558	1-216-680-11	s	METAL 16K 0.50% 1/10W
R560	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R561	1-216-641-11	s	METAL 390 0.50% 1/10W
R562	1-214-573-11	s	METAL 4.7K 1% 1/8W
R563	1-214-581-11	s	METAL 10K 1% 1/8W
R564	1-214-560-11	s	METAL 1.3K 1% 1/8W
R567	1-214-566-11	s	METAL 2.4K 1% 1/8W
R568	1-214-577-11	s	METAL 6.8K 1% 1/8W
R569	1-214-554-11	s	METAL 750 1% 1/8W
R579	1-216-658-11	s	METAL 2K 0.50% 1/10W
R580	1-216-650-11	s	METAL 910 0.50% 1/10W
R581	1-216-650-11	s	METAL 910 0.50% 1/10W
R582	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R583	1-216-669-11	s	METAL 5.6K 0.50% 1/10W
R584	1-216-651-11	s	METAL 1K 0.50% 1/10W
R585	1-216-675-11	s	METAL 10K 0.50% 1/10W
R586	1-216-674-11	s	METAL 9.1K 0.50% 1/10W
R587	1-216-684-11	s	METAL 24K 0.50% 1/10W
R588	1-216-671-11	s	METAL 6.8K 0.50% 1/10W
R591	1-216-683-11	s	METAL 22K 0.50% 1/10W
R592	1-216-677-11	s	METAL 12K 0.50% 1/10W
R597	1-216-667-11	s	METAL 4.7K 0.50% 1/10W
R598	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R599	1-216-683-11	s	METAL 22K 0.50% 1/10W
R608	1-216-643-11	s	METAL 470 0.50% 1/10W
R612	1-216-603-11	s	METAL 10 0.50% 1/10W
R613	1-216-683-11	s	METAL 22K 0.50% 1/10W
R615	1-247-881-00	s	CARBON 12K 5% 1/4W S/N UP TO 10135 (FOR J) S/N UP TO 20130 (FOR UC) S/N UP TO 30020 (FOR EK)
R616	1-247-881-00	s	CARBON 12K 5% 1/4W S/N UP TO 10135 (FOR J) S/N UP TO 20130 (FOR UC) S/N UP TO 30020 (FOR EK)
RB101	1-235-531-11	s	3000/4203
RB301	1-235-533-11	s	3000/6222
RB501	1-235-532-11	s	3000/5361

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Ref. No.	Part No.	SP	Description
RV1	1-228-457-11	s	RES, ADJ, CERMET 2K
RV2	1-228-458-11	s	RES, ADJ, CERMET 5K
RV101	1-228-457-11	s	RES, ADJ, CERMET 2K
RV102	1-228-456-11	s	RES, ADJ, CERMET 1K
RV103	1-228-457-11	s	RES, ADJ, CERMET 2K
RV104	1-228-456-11	s	RES, ADJ, CERMET 1K
RV105	1-228-455-11	s	RES, ADJ, CERMET 500
RV106	1-228-457-11	s	RES, ADJ, CERMET 2K
RV107	1-228-456-11	s	RES, ADJ, CERMET 1K
RV108	1-228-459-11	s	RES, ADJ, CERMET 10K
RV109	1-228-458-11	s	RES, ADJ, CERMET 5K
RV301	1-228-457-11	s	RES, ADJ, CERMET 2K
RV302	1-228-456-11	s	RES, ADJ, CERMET 1K
RV303	1-228-457-11	s	RES, ADJ, CERMET 2K
RV304	1-228-456-11	s	RES, ADJ, CERMET 1K
RV305	1-228-455-11	s	RES, ADJ, CERMET 500
RV306	1-228-457-11	s	RES, ADJ, CERMET 2K
RV307	1-228-456-11	s	RES, ADJ, CERMET 1K
RV308	1-228-456-11	s	RES, ADJ, CERMET 1K
RV309	1-228-458-11	s	RES, ADJ, CERMET 5K
RV501	1-228-457-11	s	RES, ADJ, CERMET 2K
RV502	1-228-456-11	s	RES, ADJ, CERMET 1K
RV503	1-228-457-11	s	RES, ADJ, CERMET 2K
RV504	1-228-456-11	s	RES, ADJ, CERMET 1K
RV505	1-228-455-11	s	RES, ADJ, CERMET 500
RV506	1-228-457-11	s	RES, ADJ, CERMET 2K
RV507	1-228-456-11	s	RES, ADJ, CERMET 1K
RV508	1-228-460-11	s	RES, ADJ, CERMET 20K
RV509	1-228-458-11	s	RES, ADJ, CERMET 5K
S301	1-570-857-11	s	SLIDE

Ref. No.	Part No.	SP	Description

	FRAME (1/2)		

RV103	1-226-786-00	s	RES, VAR, CERMET 10k "IRIS"
RV104	1-226-786-00	s	RES, VAR, CERMET 10k "MASTER BLACK"
S103	1-570-172-11	s	PUSH (1 KEY) "CALL"
S104	1-553-969-00	s	TOGGLE "KNEE"
S105	1-571-290-11	s	TOGGLE "AUTO SETUP"
S106	1-553-969-00	s	TOGGLE "IRIS"

	CP-120 BOARD		

	A-7513-609-A	o	MOUNTED CIRCUIT BOARD "CP-120"
	1-624-115-11	o	PRINTED CIRCUTI BOARD "SW-242"
CN1	1-563-239-11	o	RECEPTACLE, 40P FEMALE
CN2	1-564-001-11	o	RECEPTACLE, 2P MALE
	1-562-147-11	o	PLUG HOUSING, 2P
	1-563-088-11	o	PLUG CONTACT
CN3	1-506-486-11	o	RECEPTACLE, 7P FEMALE
	1-562-152-11	o	PLUG HOUSING, 7P
	1-563-088-11	o	PLUG CONTACT
D1	8-719-920-13	s	GL-9HY10
D2	8-719-920-13	s	GL-9HY10
D3	8-719-920-13	s	GL-9HY10
D4	8-719-920-13	s	GL-9HY10
D5	8-719-812-33	s	TLG123A
D6	8-719-920-55	s	SPR-54MVW
D7	8-719-100-03	s	1S2835
D8	8-719-100-03	s	1S2835
D9	8-719-100-03	s	1S2835
D10	8-719-918-99	s	LT-9220D
D11	8-719-812-33	s	TLG123A
D12	8-719-100-03	s	1S2835
D13	8-719-100-03	s	1S2835
D14	8-719-920-13	s	GL-9HY10
D15	8-719-920-13	s	GL-9HY10
D16	8-719-920-13	s	GL-9HY10
D17	8-719-920-13	s	GL-9HY10
D18	8-719-920-13	s	GL-9HY10
D19	8-719-920-13	s	GL-9HY10
D20	8-719-920-13	s	GL-9HY10

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Ref.No.	Part No.	SP	Description
D21	8-719-920-13	s	GL-9HY10
D22	8-719-100-03	s	1S2835
D23	8-719-100-03	s	1S2835
D24	8-719-100-03	s	1S2835
D25	8-719-100-03	s	1S2835
D26	8-719-100-03	s	1S2835
D27	8-719-100-03	s	1S2835
D28	8-719-100-03	s	1S2835
IC1	8-759-102-82	s	UPD82C43G:NEC
IC2	8-759-102-82	s	UPD82C43G:NEC
Q1	8-729-100-76	s	2SA812-M6
Q2	8-729-100-76	s	2SA812-M6
Q3	8-729-100-76	s	2SA812-M6
Q4	8-729-100-76	s	2SA812-M6
Q5	8-729-100-76	s	2SA812-M6
Q6	8-729-100-76	s	2SA812-M6
Q7	8-729-100-76	s	2SA812-M6
Q8	8-729-100-76	s	2SA812-M6
Q9	8-729-100-76	s	2SA812-M6
Q10	8-729-100-76	s	2SA812-M6
Q11	8-729-100-76	s	2SA812-M6
R6	1-249-402-11	s	CARBON 56 5% 1/4W
R10	1-249-402-11	s	CARBON 56 5% 1/4W
R11	1-249-395-11	s	CARBON 15 5% 1/4W
R13	1-249-402-11	s	CARBON 56 5% 1/4W
R14	1-249-402-11	s	CARBON 56 5% 1/4W
R15	1-249-402-11	s	CARBON 56 5% 1/4W
R16	1-249-402-11	s	CARBON 56 5% 1/4W
RV1	1-224-981-21	s	CERMET 5K "KNEE"
RV2	1-224-981-21	s	CERMET 5K "DETAIL"
RV3	1-224-981-21	s	CERMET 5K "GAMMA"
RV4	1-224-981-21	s	CERMET 5K "B BLACK"
RV5	1-224-981-21	s	CERMET 5K "R BLACK"
RV6	1-224-981-21	s	CERMET 5K "B WHITE"
RV7	1-224-981-21	s	CERMET 5K "R WHITE"
S1	1-570-221-11	s	PUSH "PANEL ACTIVE"
S2	1-570-217-11	s	PUSH "MONITOR SELECT R"
S3	1-570-218-11	s	PUSH "MONITOR SELECT G"
S4	1-570-219-11	s	PUSH "MONITOR SELECT B"
S5	1-570-213-61	s	PUSH "MONITOR SELECT -G"
S6	1-570-213-41	s	PUSH "MONITOR SELECT ENC"

Ref.No.	Part No.	SP	Description
IF-177 BOARD			
	A-7513-608-A	o	MOUNTED CIRCUIT BOARD "IF-177"
	1-563-753-11	o	SOCKET, PIN, 12P
C1	1-127-512-11	o	ELECT 10 20% 25V
C3	1-127-487-11	s	ELECT 4.7 20% 10V
C5	1-163-133-00	s	CERAMIC 470PF 5% 50V
C7	1-127-491-00	s	ELECT 22 20% 6.3V
C8	1-161-883-21	s	CERAMIC 0.0015 50V
C9	1-163-117-00	s	CERAMIC 100PF 5% 50V
C10	1-127-518-11	s	ELECT 100 20% 16V
C12	1-127-491-11	s	ELECT 22 20% 10V
C13	1-127-491-11	s	ELECT 22 20% 10V
C17	1-163-097-00	s	CERAMIC 15PF 5% 50V
C18	1-163-097-00	s	CERAMIC 15PF 5% 50V
C19	1-131-377-00	s	TANTALUM 10 10% 6.3V
C20	1-127-499-11	s	ELECT 22 20% 16V
C21	1-102-114-00	s	CERAMIC 470PF 5% 50V S/N UP TO 20030 (FOR UC) S/N UP TO 30020 (FOR EK) S/N UP TO 10020 (FOR J)
C22	1-163-105-00	s	CERAMIC 33PF 5% 50V
CN1	1-506-620-11	o	RECEPTACLE, 10P, FEMALE
CN2	1-506-493-11	o	RECEPTACLE, 14P, FEMALE
	1-562-185-00	o	PLUG HOUSING, 14P
	1-563-088-11	o	PLUG CONTACT
CN3	1-506-731-21	o	RECEPTACLE, 40P, MALE
D1	8-719-981-00	s	ERB81-004
D2	8-719-100-03	s	1S2835
D3	8-719-100-03	s	1S2835
D4	8-719-100-03	s	1S2835
D5	8-719-100-03	s	1S2835
D6	8-719-100-03	s	1S2835
D7	8-719-100-03	s	1S2835
D8	8-719-100-03	s	1S2835
D9	8-719-100-03	s	1S2835
D10	8-719-100-03	s	1S2835
D11	8-719-100-03	s	1S2835
D12	8-719-100-03	s	1S2835
D13	8-719-100-03	s	1S2835
D14	8-719-100-03	s	1S2835
D15	8-719-100-03	s	1S2835
D16	8-719-100-03	s	1S2835
D17	8-719-100-03	s	1S2835

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Ref. No.	Part No.	SP	Description
FB1	1-535-178-11	s	RES, FERRITE
FB2	1-535-178-11	s	RES, FERRITE
FB3	1-535-178-11	s	RES, FERRITE
IC1	8-759-908-95	s	TL1451CNS:TI
IC2	8-759-009-04	s	MC14050BF:MOTOROLA
IC3	8-759-009-11	s	MC14070BF:MOTOROLA
IC4	8-759-204-71	s	TC40H163F:TOSHIBA
IC5	8-759-925-74	s	SN74HC04NS:TI
IC6	8-759-915-76	s	TL7700CP:TI
IC7	8-759-971-23	s	MSM80C49-757GS-K:OKI
IC8	8-759-971-23	s	MSM80C49-757GS-K:OKI
IC9	8-759-204-90	s	TC40H374F:TOSHIBA
IC10	8-759-204-83	s	TC40H245F:TOSHIBA
IC11	8-759-204-60	s	TC40H139F:TOSHIBA
IC12	8-759-204-51	s	TC40H008F:TOSHIBA
IC13	8-759-204-89	s	TC40H373F:TOSHIBA
IC14	8-759-722-53	s	27C64-25-C35PNL1.04:FUJITSU
IC15	8-759-102-82	s	UPD82C43G:NEC
IC16	8-759-102-82	s	UPD82C43G:NEC
IC17	8-759-100-93	s	UPC393G2:NEC
IC18	8-759-009-05	s	MC14051BF:MOTOROLA
IC19	8-759-009-05	s	MC14051BF:MOTOROLA
IC20	8-759-009-49	s	MC14532BF:MOTOROLA
IC21	8-759-204-83	s	TC40H245F:TOSHIBA
L1	1-410-794-11	s	MICRO 330
L2	1-408-413-21	s	MICRO 22
L3	1-408-413-21	s	MICRO 22
L4	1-408-413-21	s	MICRO 22
L5	1-408-413-21	s	MICRO 22
Q1	8-729-105-29	s	2SA1385
R1	1-216-682-11	s	METAL 20K 0.50% 1/10W
R3	1-216-682-11	s	METAL 20K 0.50% 1/10W
R5	1-216-679-11	s	METAL 15K 0.50% 1/10W
R6	1-249-409-11	s	CARBON 220 5% 1/4W
R8	1-216-689-11	s	METAL 39K 0.50% 1/10W
R9	1-216-678-11	s	METAL 13K 0.50% 1/10W
R15	1-216-679-11	s	METAL 15K 0.50% 1/10W
R17	1-216-657-11	s	METAL 1.8K 0.50% 1/10W
R93	1-214-525-11	s	METAL 47 1.00% 1/8W

Ref. No.	Part No.	SP	Description
RB1	1-232-509-21	s	(25k/50k) x 10
RV1	1-228-473-11	s	CERMET 5K
RV2	1-228-474-11	s	CERMET 10K
RV3	1-228-474-11	s	CERMET 10K
RV4	1-228-474-11	s	CERMET 10K
RV5	1-228-474-11	s	CERMET 10K
RV6	1-228-474-11	s	CERMET 10K
RV7	1-228-474-11	s	CERMET 10K
RV8	1-228-474-11	s	CERMET 10K
S1	1-553-252-11	s	ROTARY
S2	1-571-289-11	s	DIGITAL ROTARY (DIP)
S3	1-570-623-11	s	DIP
S4	1-570-602-11	s	DIP
S5	1-570-610-11	s	TOGGLE
S7	1-571-289-11	s	DIGITAL ROTARY (DIP)
S8	1-571-289-11	s	DIGITAL ROTARY (DIP)
X1	1-527-941-11	s	CRYSTAL, 10.944MHz

SW-225 BOARD

	1-624-112-11	o	PRINTED CIRCUIT BOARD "SW-225"
	1-563-753-11	o	SOCKET, PIN, 12P
S1	1-571-071-11	s	TOGGLE "OUTPUT"
S2	1-571-071-11	s	TOGGLE "W/B BAL AUTO/MANU/PRESET"
S3	1-554-395-11	s	TOGGLE "W/B BAL AWB/ABB"
S4	1-571-070-11	s	TOGGLE "SHUTTER"

SW-242 BOARD

	1-624-115-11	o	PRINTED CIRCUIT BOARD "SW-242"
S1	1-570-817-11	s	ROTARY "GAIN"

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Ref.No.	Part No.	SP	Description
SW-242 BOARD			
	1-624-115-11	o	PRINTED CIRCUIT BOARD "SW-242"
S1	1-570-817-11	s	ROTARY "FILTER ND"
SW-242 BOARD			
	1-624-115-11	o	PRINTED CIRCUIT BOARD "SW-242"
S1	1-570-817-11	s	ROTARY "FILTER CC"
SW-266 BOARD			
	1-624-569-11	o	PRINTED CIRCUIT BOARD "SW-266"
S1	1-570-132-11	s	ROTARY "CABLE COMP"

Ref.No.	Part No.	SP	Description
FRAME (2/2)			
C101	1-161-059-11	s	CAP, CERAMIC 0.047 10% 25V
CN101	1-564-968-11	s	RECEPTACLE, 16P, FEMALE "MSU"
CN102	1-564-968-11	s	RECEPTACLE, 16P, FEMALE "CCU"
CN103	1-561-482-00	o	RECEPTACLE, 41P, FEMALE "CAMERA"
CN110	1-564-968-11	s	RECEPTACLE, 16P, FEMALE "RCP"
CN119	1-561-376-00	s	RECEPTACLE, 4P, FEMALE "WF MODE"
CN120	1-509-184-51	s	XLR-3P "MIC OUT" (FOR J)
	1-509-176-51	s	XLR-3P "MIC OUT" (FOR UC, EK)
CN122	1-561-846-31	s	RECEPTACLE, 7P, MALE "R TALLY/INCOM"
CN123	1-561-846-31	s	RECEPTACLE, 7P, MALE "G TALLY/PGM"
CN124	1-561-829-00	o	JACK HOUSING, 2P
	1-535-070-11	o	JACK CONTACT
	1-561-830-00	o	PLUG HOUSING, 2P
	1-535-072-11	o	PLUG CONTACT
CN125	1-561-829-00	o	JACK HOUSING, 2P
	1-535-070-11	o	JACK CONTACT
	1-561-830-00	o	PLUG HOUSING, 2P
	1-535-072-11	o	PLUG CONTACT
J101	1-507-676-11	s	JACK, PHONE "INCOM" S/N UP TO 20630 (UC) 30560 (EK)
	1-507-184-11	s	JACK, PHONE "INCOM" S/N 20701 AND HIGHER (UC) 30601 AND HIGHER (EK)
J102	1-507-676-11	s	JACK, PHONE "PGM" S/N UP TO 20630 (UC) 30560 (EK)
	1-507-184-11	s	JACK, PHONE "PGM" S/N 20701 AND HIGHER (UC) 30601 AND HIGHER (EK)
R101	1-247-843-11	s	CARBON 3.3k 5% 1/4W
R102	1-247-843-11	s	CARBON 3.3k 5% 1/4W
RV101	1-230-817-11	s	RES, VAR, CARBON"INCOM"
RV102	1-230-817-11	s	RES, VAR, CARBON"PGM"
S101	1-553-626-11	s	TOGGLE "MIC ON/OFF"
S102	1-553-626-11	s	TOGGLE "COMM/PRIV"

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Ref.No.	Part No.	SP	Description
	CN-244 BOARD		
	1-624-114-11	o	PRINTED CIRCUIT BOARD "CN-244"
CN1	1-564-005-11	o	RECEPTACLE, 6P, MALE
CN2	1-564-003-11	o	RECEPTACLE, 4P, MALE
CN3	1-564-005-21	o	RECEPTACLE, 6P, MALE
CN4	1-564-005-31	o	RECEPTACLE, 6P, MALE
CN104	1-562-261-81	s	CONNECTOR, COAXIAL (BNC)
CN105	1-562-261-81	s	CONNECTOR, COAXIAL (BNC)
CN106	1-562-261-81	s	CONNECTOR, COAXIAL (BNC)
CN107	1-562-261-81	s	CONNECTOR, COAXIAL (BNC)
CN108	1-562-261-81	s	CONNECTOR, COAXIAL (BNC)
CN109	1-562-261-81	s	CONNECTOR, COAXIAL (BNC)
CN111	1-562-261-81	s	CONNECTOR, COAXIAL (BNC)
CN112	1-562-261-81	s	CONNECTOR, COAXIAL (BNC)
CN113	1-562-261-81	s	CONNECTOR, COAXIAL (BNC)
CN114	1-562-261-81	s	CONNECTOR, COAXIAL (BNC)
CN115	1-562-261-81	s	CONNECTOR, COAXIAL (BNC)
CN116	1-562-261-81	s	CONNECTOR, COAXIAL (BNC)
CN117	1-562-261-81	s	CONNECTOR, COAXIAL (BNC)
CN118	1-562-261-81	s	CONNECTOR, COAXIAL (BNC)

Ref.No.	Part No.	SP	Description
CN9	1-506-634-11	o	RECEPTACLE, 10P, MALE
CN10	1-506-631-11	o	RECEPTACLE, 4P, MALE
	1-563-116-11	o	PLUG HOUSING, 4P,
	1-563-115-11	o	PLUG CONTACT
CN11	1-506-633-11	o	RECEPTACLE, 8P, MALE
CN12	1-506-638-11	o	RECEPTACLE, 18P, MALE
CN13	1-506-631-11	o	RECEPTACLE, 4P, MALE
	1-563-116-11	o	PLUG HOUSING, 4P,
	1-563-115-11	o	PLUG CONTACT
CN14	1-506-634-11	o	RECEPTACLE, 10P, MALE
	1-563-119-11	o	PLUG HOUSING, 10P,
	1-563-115-11	o	PLUG CONTACT
CN15	1-506-631-11	o	RECEPTACLE, 4P, MALE
	1-563-116-11	o	PLUG HOUSING, 4P,
	1-563-115-11	o	PLUG CONTACT
CN16	1-506-631-11	o	RECEPTACLE, 4P, MALE
	1-563-116-11	o	PLUG HOUSING, 4P,
	1-563-115-11	o	PLUG CONTACT
CN17	1-506-635-11	o	RECEPTACLE, 12P, MALE
	1-563-120-11	o	PLUG HOUSING, 12P,
	1-563-115-11	o	PLUG CONTACT
CN18	1-506-636-11	o	RECEPTACLE, 14P, MALE
CN19	1-506-633-11	o	RECEPTACLE, 8P, MALE
	1-563-118-11	o	PLUG HOUSING, 8P,
	1-563-115-11	o	PLUG CONTACT
CN20	1-506-632-11	o	RECEPTACLE, 6P, MALE
	1-563-117-11	o	PLUG HOUSING, 6P,
	1-563-115-11	o	PLUG CONTACT

	MB-175 BOARD		
	A-7513-607-A	o	MOUNTED CIRCUIT BOARD "MB-175"
CN1	1-560-746-11	o	RECEPTACLE, 53P, FEMALE
CN2	1-560-746-11	o	RECEPTACLE, 53P, FEMALE
CN3	1-560-746-11	o	RECEPTACLE, 53P, FEMALE
CN4	1-560-746-11	o	RECEPTACLE, 53P, FEMALE
CN5	1-560-746-11	o	RECEPTACLE, 53P, FEMALE
CN6	1-506-634-11	o	RECEPTACLE, 10P, MALE
CN7	1-506-636-11	o	RECEPTACLE, 14P, MALE
	1-563-121-11	o	PLUG HOUSING, 14P
	1-563-115-11	o	PLUG CONTACT
CN8	1-506-636-11	o	RECEPTACLE, 14P MALE
	1-563-121-11	o	PLUG HOUSING, 14P
	1-563-115-11	o	PLUG CONTACT

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D-4. SUPPLIED ACCESSDRIES

Ref. No.	Part No.	SP	Description
	A-7513-613-A	o	EXTENSION BOARD "EX-152"
	A-7612-310-A	o	PLATE ASSY, NUMBER
	⚠ 1-534-754-00	s	CORD, POWER (FOR J)
	1-551-812-00	s	CORD, POWER (FOR UC)
	1-560-155-00	s	CONNECTOR, 4P PLUG, MALE

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